THE LEADING PHOTOGRAPHIC MAGAZINE

Popular Photography

OCTOBER
25c

Make-up
for
PORTRAITS

Color Photograph
by HENRY SILL
See Page 72

INFRA-RED
Debunks **SPIRITUALISM**

Hunti[illegible]yder

TONI FRISSELL: *Outdoor Specialist*

PP-89-75998-R-71
FRANK SASSMANHAUSEN
216 SUMNER ST
ELYRIA OHIO

GREAT NEWS!
AGFA
proudly announces
SUPERPAN SUPREME
ROLL FILM · FILM PACKS

TWICE AS FAST as Superpan, which it replaces, Superpan Supreme opens great new picture possibilities to roll and pack film users!

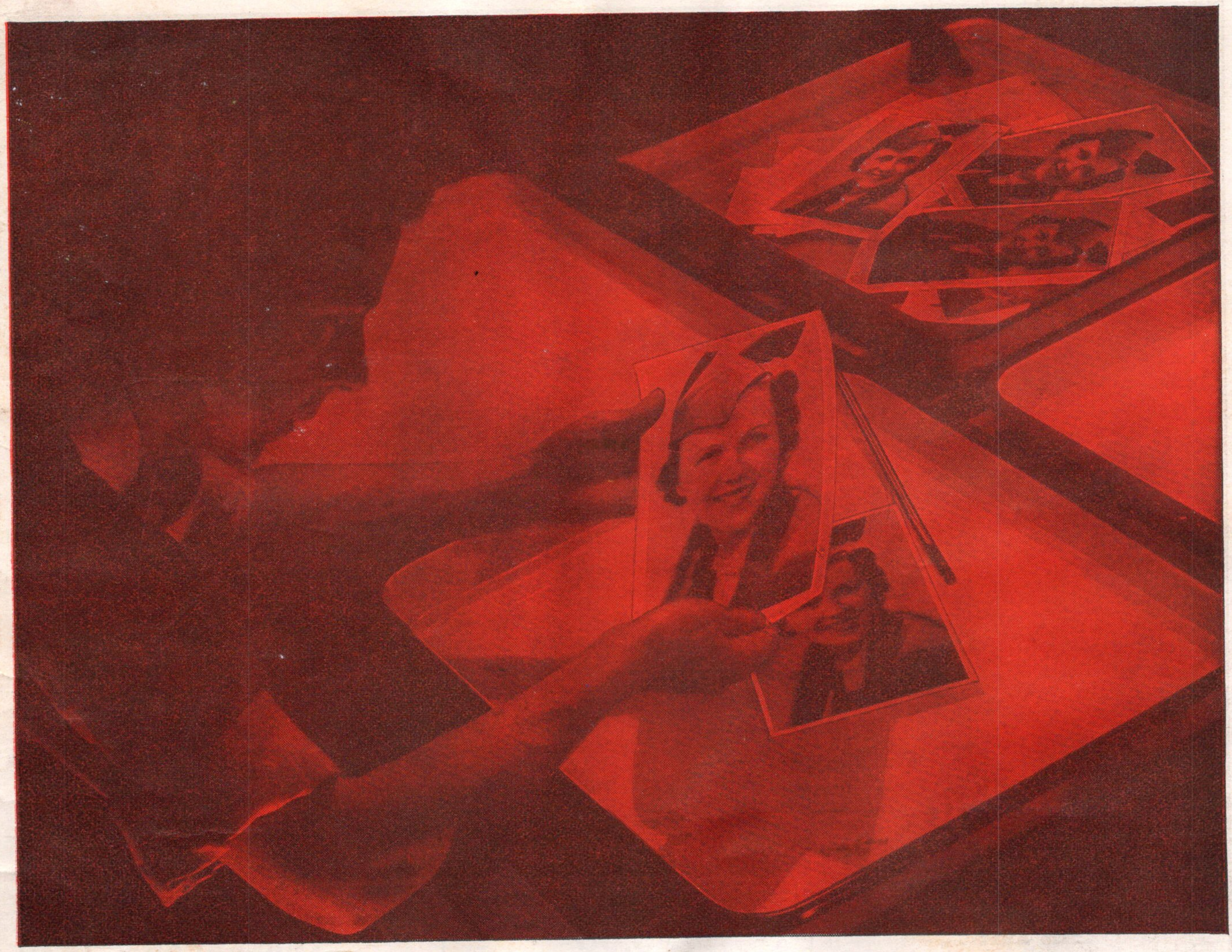
Here it is, long the choice of leading professional movie cameramen and miniature camera experts, now made in *rolls and packs!*

Faster, with finer grain and better-balanced color sensitivity—Superpan Supreme is even more the ideal all-purpose film than the Superpan it replaces. It is truly a double duty film—for pictures day or night, indoors or out.

Try Superpan Supreme today—and see how greatly Agfa has increased "that extra margin of quality"!

Agfa

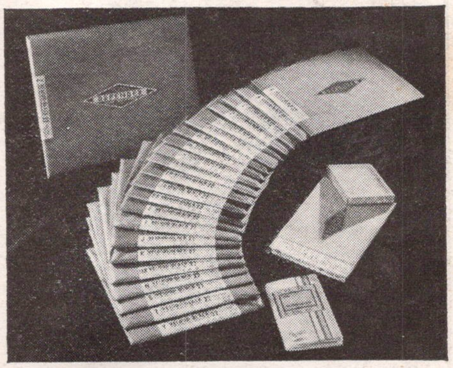
**MADE BY AGFA ANSCO CORPORATION
IN BINGHAMTON, NEW YORK, U. S. A.**



PRINTS---PRINTS---PRINTS

A thousand prints a day from this one negative is not an exceptional occurrence in the Defender Testing Laboratory. Chosen for its unusually long range of tones as a test negative to check the actual printing quality of every batch of Defender Paper, it is in steady use day in and day out—another one of the many checks, tests and inspections that every Defender Product must pass before it reaches your darkroom.

It's that sort of care that enables you to obtain in your prints every quality your skill has been able to create in your negative. The sunbeams that dance in your model's hair, the soft shading of her features bring vividness to what might have been an ordinary picture . . . because the paper you used possessed the ability to interpret a long range of tonal values . . . because it was a Defender Paper.



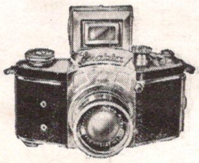
Enlargements of your favorite negatives on Velour Black will add to the thrill of print making. 25 different surfaces to choose from—8 in 4 degrees of contrast. Write for FREE folder, or ask your dealer.

defender

PHOTO SUPPLY CO., INC., ROCHESTER, N. Y.

EXAKTA

SINGLE LENS REFLEX

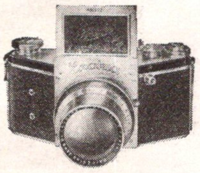


KINE

24 x 36 mm

Takes the standard 35 mm film. Wide variety of accessories plus the single lens reflex principle makes this the ideal camera for all specialized photography

●



V. P.

4 x 6.5 cm

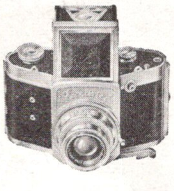
EXAKTA JUNIOR
$67.50 to $75.00

EXAKTA MODEL B
$110 to $155

NIGHT EXAKTA MODEL B
$215 to $310

EXAKTA MODEL C
(plate back)
$125 to $170

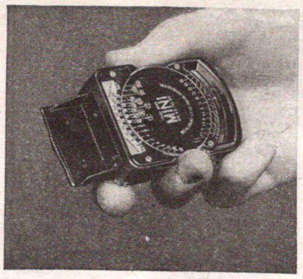
●



THE NEW 6x6

(12 on 120 film)

Single lever movement transports film and sets shutter—and the standard EXAKTA features of built-in flash synchronizer-shutter speeds from 1/1000 to 12 seconds, etc. Write for catalogs.



"MINI"

The new electric exposure meter. PRE-SET — SENSITIVE — EASY TO READ — SIMPLE TO OPERATE — SMALL AND LIGHT.

STILL and CINE

Wide range—film speeds to 38° Sch.; exposures 1/2000 to 60 sec.; 8 to 64 frames per second.

$12.50

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INSTOSCOPE

INSTOSCOPE

The popular visual exposure meter

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INSTANT

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EVEREADY

●

ONE HAND OPERATION

$3.00

Leather case **$.50**

A similar model for cine photography THE INSTOCINE.

●

The Expophot

$1.75

DIN
expophot

The visual exposure meter that is held in the hand and read like a book. No squinting into bright light. No eye adaptation influence. TINY—SIMPLE—ACCURATE.

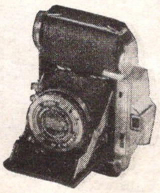
SUPER BALDINA

24 x 36 mm

for 35 mm film

WITH COUPLED RANGEFINDER

AUTOMATIC PARALLAX COMPENSATION



COMPUR SHUTTER

Trioplan f/2.9	Tessar f/2.8
$69.50	**$95.00**

●

JUBILETTE

24 x 36 mm

f 2.9

Trioplan

Compur Shutter

$35.00

An inexpensive high precision camera for black and white or color. Body release for simple operation.

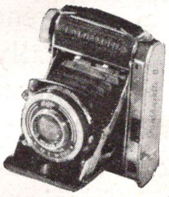
FOR BLACK AND WHITE AND COLOR

●

BALDAXETTE

6 x 6

(2¼ x 2¼)



Coupled rangefinder
Automatic film placement. Coupled parallax adjustment.

Trioplan f/2.9—Compur Rapid
$90.00

Tessar f/2.8—Compur
$100.00

Tessar f/2.8—Compur Rapid
$107.00

MAIL ORDERS FILLED

Willoughbys

110 WEST 32ND ST., N. Y.

WORLD'S LARGEST EXCLUSIVE CAMERA SUPPLY HOUSE

MAIL ORDERS FILLED

POPULAR PHOTOGRAPHY. Volume 5, Number 4, October, 1939. Published monthly by Ziff-Davis Publishing Co., at 608 S. Dearborn St., Chicago, Ill. Entered as second-class matter July 30, 1937, at the Post Office, Chicago, Ill., under the act of March 3, 1879. Subscription $2.50 per year, foreign $1.00 per year extra, except Canada.

New
G-E FLASH BULBS
...to light up those shadows on action shots

Here's a simple way to avoid harsh contrasts and get shadow detail in action shots: light them with synchronized flash at high shutter speeds. New G-E flash bulbs fit every picture need; for ultra high speed, with focal-plane cameras, new G-E No. 31 and 30; for general use, new G-E No. 16, 7 and 11; for extra covering power, new G-E No. 21. Ask your dealer or write for complete data. Dept. 166-PP, General Electric Co., Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC
MAZDA PHOTOFLASH LAMPS

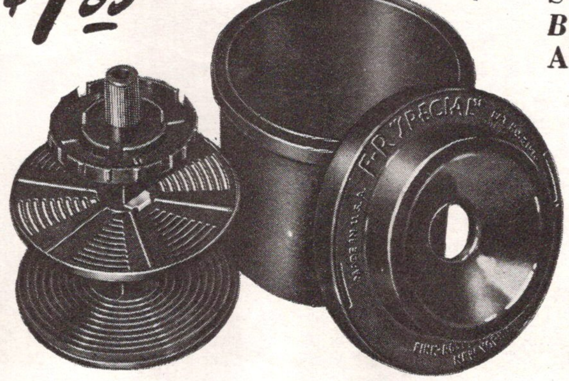
No. 7
No. 16
No. 11
No. 21
No. 30
No. 31

10 IMPORTANT REASONS TO BUY THE F-R "SPECIAL"!

(THE NEW F-R ADJUSTABLE ROLL FILM TANK)

1. **GENUINE BAKELITE.** Constructed of genuine Bakelite, chemically resistant, especially compounded for photographic use.
2. **STAINLESS STEEL CLIPS.** Non-corrosive, non-fogging. To eliminate the danger of breakage during adjustment.
3. **ADJUSTABLE.** The flanges sturdily constructed to withstand lots of usage, are removable for quick drying and cleaning. See chart for all sizes to be accommodated.
4. **LOADING.** Can be loaded from either inside or outside—or both.
5. **CAPACITY.** Only 8 to 16 ounces of solution is needed. See chart for exact quantity for each size film.
6. **REVOLVING LIGHT TRAP.** Stops all light from entering and aids in the quick filling and distribution of solution over the film.
7. **CHECK STOP.** The patented F-R Check Stop prevents the film from unreeling during agitation.
8. **AGITATOR.** Built onto reel it has a hollow shell which allows a thermometer to remain in the tank during use.
9. **GUARANTEED.** Moisture and warp proof.
10. **$1.85**

$1.85



SPEAKS FOR ITSELF *BEST* AND IT SOUNDS ALMOST TOO *GOOD* TO BE TRUE!

But it is true! Go to your dealer today. Get one! See for yourself its superiority. Check carefully these 10 buying points—and if you don't think you are getting the greatest value ever offered in a developing tank your money will be refunded instantly.

Fink-Roselieve, manufacturers of F-R Developing Tanks, the biggest selling tanks in the world, and acknowledged best by camera users and dealers everywhere, are proud to introduce this new F-R "SPECIAL" which they consider the best developing tank they have ever produced. F-R tanks may be imitated but they can never be copied. Look for the "little man" on the box before you buy. It is your guarantee.

The F-R *"SPECIAL"* will accommodate:

Quantity	*Film*		*Capacity*
1 roll	35MM	(36 exposure)	8 oz.
*2 rolls	35MM	(18 exposure)	8 oz.
*3 rolls	#828	(Bantam)	8 oz.
*2 rolls	#127	(Vest Pocket)	11 oz.
*2 rolls	#129		12 oz.
*2 rolls	#120		14 oz.
1 roll	#116		16 oz.
With the addition of the F-R Double Flange† the following may be accommodated.			
*2 rolls	35MM	(36 exposure)	16 oz.
*4 rolls	35MM	(18 exposure)	16 oz.
*6 rolls	#828	(Bantam)	16 oz.

*At one time
†F-R Double Flange (Only)—$.50

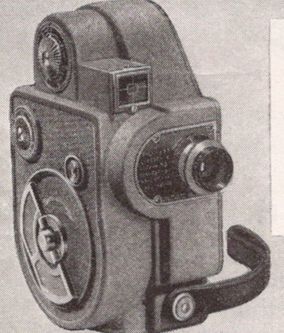
F-R
REG. U.S. PAT. OFF.

FINK-ROSELIEVE CO., INC.
109 WEST 64th STREET • NEW YORK
BOSTON: 739 Boylston Street • **CHICAGO:** The Merchandise Mart • **LOS ANGELES:** 324 North San Pedro Street

TAKE *Action* MOVIES AS YOU WANT THEM

IN S-L-O-W MOTION
AT NORMAL SPEED
OR *Super Fast*

WITH THE REVERE *5 Speed* *Super 8 MM.* CAMERA



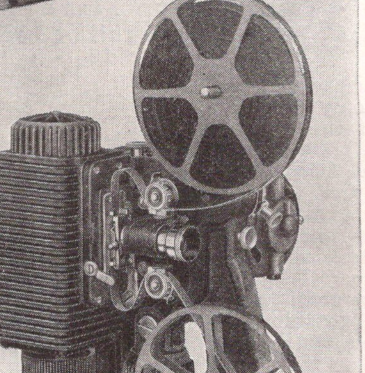
Complete with WOLLENSAK F 3.5 LENS as low as $21.95

Action pictures, made with the Revere Super 8 mm. Camera and Revere ultra-fast film, help you re-live exciting events. The 5 speeds of this modern, precision-built camera with its Wollensak F 3.5 lens takes action photographs... in slow motion... at normal speed... or at ultra-fast speeds. See the Revere Camera. Note its superior features ... built-in optical view finder... 5 speeds... 8, 12, 16, 24 or 32 frames ... adjustable footage counter ... aluminum body with hinged cover ... interchangeable lens mount for F 2.7, F 1.9 and Telephoto lenses ... complete with F 3.5 lens as low as $21.95.

Less Than 10c a Scene

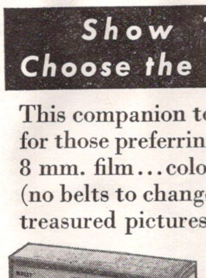
The Camera uses Revere Panchromatic film costing only $1.35 for 30 feet (including processing) ... less than 10c a scene. The *fastest* and *finest grain* 8 mm. film ever offered. Made expressly for Revere by Agfa-Ansco Company of Binghamton, N. Y., and processed at their laboratories.

Show Theatre-Quality Movies Choose the REVERE Super 8 mm. PROJECTOR!



500 WATT Capacity 1″ F 1.6 LENS Complete $49.95

This companion to the Revere Camera is the ideal replacement unit for those preferring better 8 mm. equipment. It projects all standard 8 mm. film... color or black and white... rewinds film automatically, (no belts to change)... and provides maximum film protection for the treasured pictures of your children, parents or other loved ones. It has everything... 500 watt capacity... 1″ F 1.6 lens... AC-DC motor... die-cast construction... cut gears ... 15-tooth easily threaded sprockets... double blower cooling system for lamp and film ... removable aperture shoe, easy to clean. Complete with lamp and lens $49.95. Mail coupon for literature and name of dealer!



Price $1.35, including processing

REVERE *Super 8 MM.* CINE' EQUIPMENT

REVERE CAMERA COMPANY, 320 E. 21st STREET, CHICAGO
Branches: PHILADELPHIA, KANSAS CITY, MINNEAPOLIS, LOS ANGELES, DALLAS

REVERE CAMERA COMPANY
322 East 21st Street, Chicago, Ill.
Please send literature and name of nearest dealer.

*Name*____

*Address*______________________________________

*City*_________________________ *State*_____________

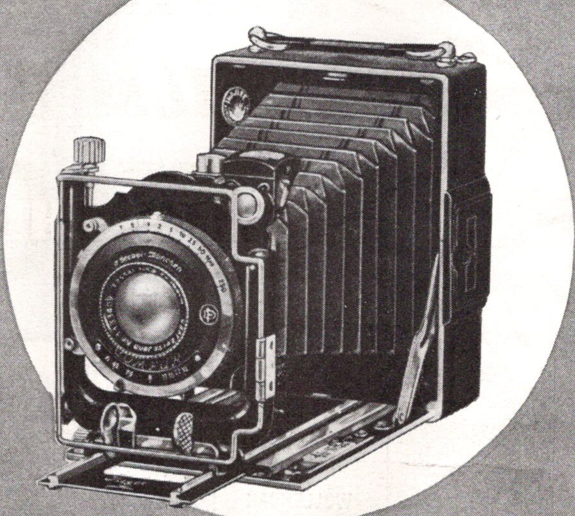
IHAGEE

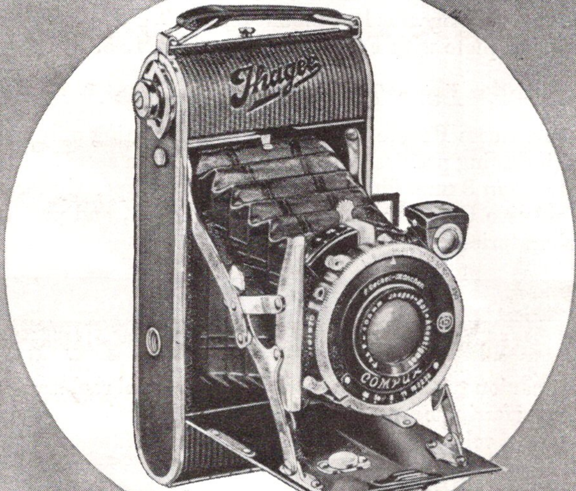
presents two famous models:

• DUPLEX

DUPLEX, a precision and versatile plate and filmpack camera, made to serve every photographic purpose of the novice, amateur, pictorialist and professional.

Fitted with a rising and falling front and special side swing adjustment. Its double extension leather bellows — which allows for photographing objects actual size—rides on an accurately machined track with direct geared rack and pinion focusing, thus keeping the lens in perfect focal plane with the film.





• AUTO-ULTRIX

AUTO-ULTRIX, a light and compact self-erecting camera, either eight 2¼"x3¼" pictures or sixteen 1⅝"x2¼" pictures to a roll of 120 film.

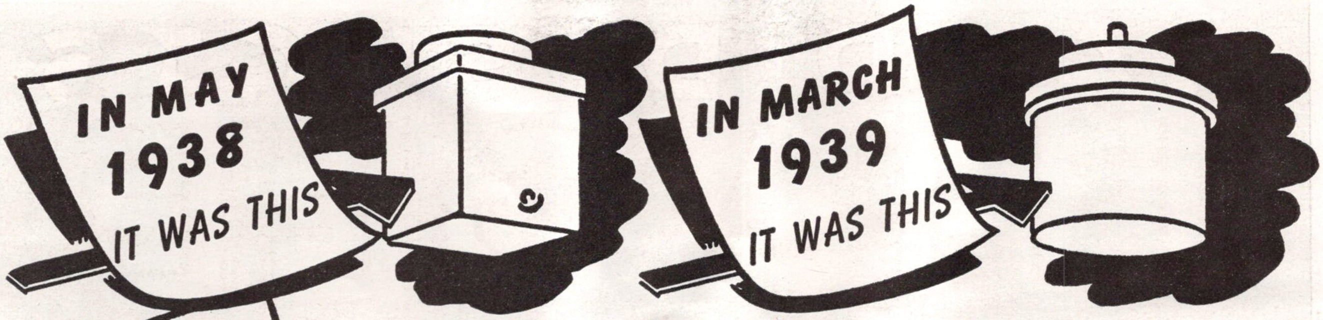
Size of camera, 3¼x6".
Weighs only 20 ounces.
Helical focusing mount.
Pressure Plate Back.
Protected Ruby Windows.
Optical View Finder and Waist Level Finder.
Aluminum Body, Leatherette Covered.
All Controls visible at the top of the camera.
All metal parts heavily nickel plated.
A slight pressure will cause the camera to open and to be focussed at infinity.

Wholesale
Distribution:
Medo Photo Supply
Corporation
15 West 47th Street
New York, N. Y.

Ihagee
CAMERA WORKS
STEENBERGEN&Co
DRESDEN-Striesen 418
(Germany)

West Coast Distribution:
CRAIG MOVIE SUPPLY
COMPANY, INC.
1053 South Olive Street
Los Angeles, California
San Francisco Office:
149 Montgomery St.

Ask your Dealer for a free demonstration! Descriptive folder free on application!

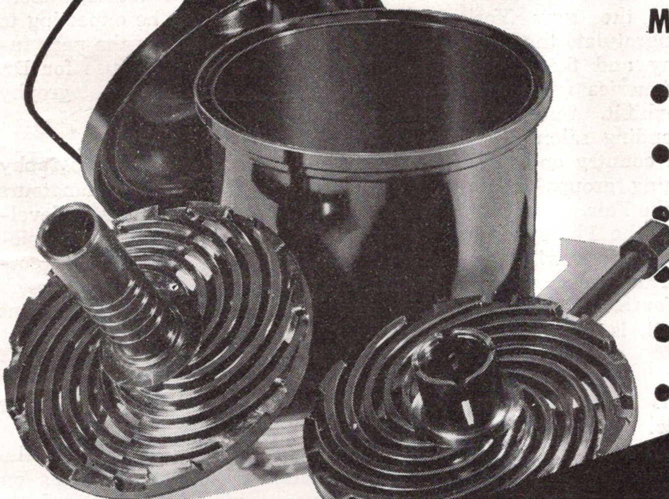


and now it's the

ELKAY ROTO REEL

FILM PACK and CUT FILM

DEVELOPING TANK



With the Sensational Adjustable Spiral Loading Reel Made Especially for Cut Film and Film Pack Negatives

- Takes cut film and film pack from 35mm to 2½"x3½"
- Uses less solution; produces beautiful negatives
- Negatives slip quickly into the fan-like grooves
- Operates like any adjustable developing tank
- Negatives protected from blotches, scratches, marks
- Made of chemical resisting, tempered bakelite
- Loads a dozen negatives

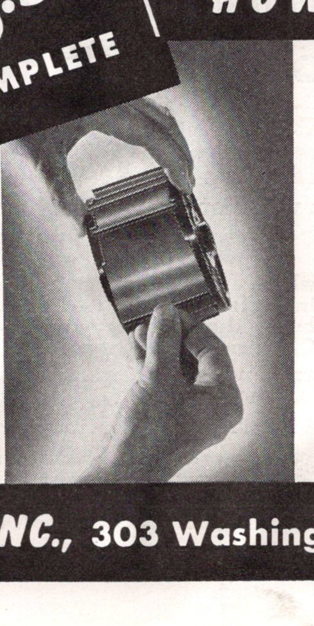
$3.50 COMPLETE

The Elkay ROTO REEL for Film Pack and Cut Film May be Purchased Separately at $2.00.

It will fit any standard size developing tank now on the market.

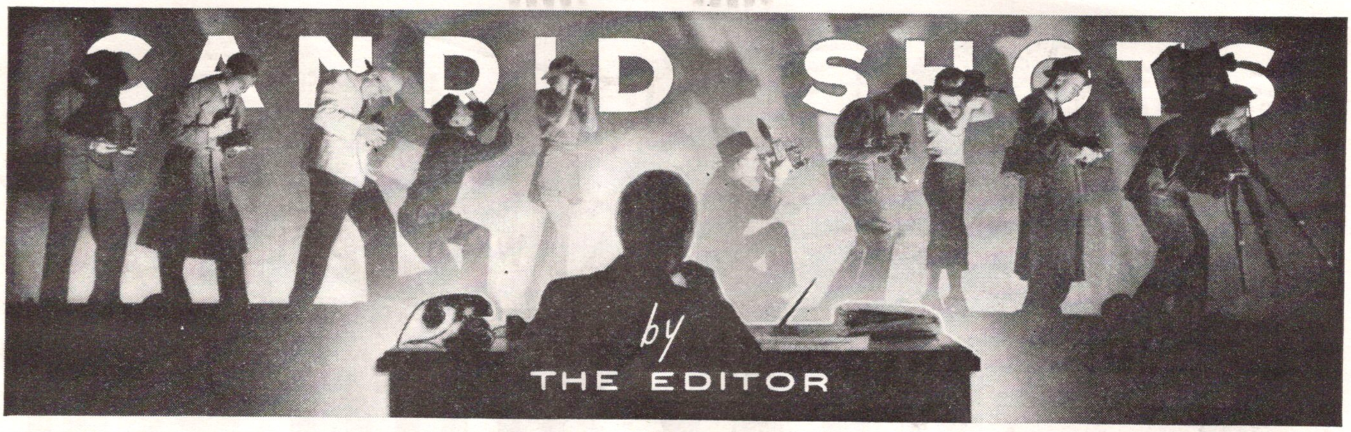
Don't waste any time . . . see your dealer . . . or write immediately! Made in the U. S. A.

HOW IT WORKS:



The ROTO REEL is made with 12 fan-like grooves which spiral out from the center core. To load, slip each negative into its own groove. Negatives are held firmly without buckling or slipping. Sliding the top section up or down on the center core gives the proper size for negatives from 35mm to 2½"x3½".

ELKAY PHOTO PRODUCTS, INC., 303 Washington St., Newark, N.J.



CANDID SHOTS

by THE EDITOR

ONLY one more issue separates us from the big *Annual Salon Issue* of POPULAR PHOTOGRAPHY—our December issue. We have already given you an inkling of what this giant issue will contain but a lot more remains to be said.

Recognizing the growing popularity of color photography, we have decided to run in the *Annual Salon Issue* at least eight pages of outstanding color pictures. Possibly there will be more.

We want to make this color section representative of the many types of work that are being done in this medium. Therefore, you can count on seeing a great variety of subjects in color—from portraits, illustration shots and landscapes to nude studies.

The latter, which will be one of the big features of the *Annual Salon Issue,* were made for POPULAR PHOTOGRAPHY by Ivan Dmitri whom we consider one of the leading exponents of photography with natural color film.

ANOTHER feature to wait for is the *Directory Supplement* in the December issue. You may not be aware of it but not a day passes without improvements on existing photographic equipment and the appearance of new gadgets.

Nobody, probably not even the best organized camera store, can keep track of this flood of new developments. At the time of its appearance, our May *Directory Issue* represented the only complete listing of photographic equipment. Hundreds of new items have appeared since on the market.

To give a complete listing of this new equipment is the purpose of our *Directory Supplement.* It is intended for the use of both photographers and photo dealers and its publication in the December issue is timed in such a manner that from it you will be able to make your Christmas selections.

OUR $3,700 Picture Contest is nearing its deadline at this writing and it can be safely said that it is one of the biggest contests ever held not only on account of the huge prizes but also regarding participation.

A long row of baskets is filled with black-and-white prints, packages of Kodachromes, Dufaycolor transparencies, and color prints produced by one or the other of the numerous printing methods.

Judging will begin on September 15, and we will make a thorough job of it. We are always on the lookout for good pictures and we realize that this is an excellent chance to find a large selection.

THERE is nothing like good pictures to popularize photography. And there is hardly a spot where pictures could be shown to greater masses of interested people than the New York World's Fair. We congratulate the Eastman Kodak Company and the Photographic Society of America for jointly arranging such an exhibit. The P.S.A. has assembled outstanding salon prints from all parts of the country and these are shown in changing groups in the Eastman Building at the Fair.

In cooperation with the Photographic Society, POPULAR PHOTOGRAPHY will show you several pictures from these exhibits. Our *Picture of the Month* in the current issue, by J. F. Abbott, is one of these selections.

PHOTOGRAPHY is aiding many branches of science. Among its lesser known applications and accomplishments is research work in spiritualism.

Most mediums claim that they can produce their psychic phenomena only in darkened seance rooms. No reliable observations and no visible records of these phenomena could be made under such circumstances, until infra-red photography came to the rescue.

The man who has done most of the pioneering work in this field and who has developed a technique of infra-red flash photography, Dr. Nandor Fodor, describes his technique and his unusual experiences with phony mediums in the lead story of this issue.

It's not only interesting reading but will also teach you a lot of new things about infra-red. You may not be expecting to communicate with spirits in the near future but may find practical use for Dr. Fodor's methods for trick photography in the dark.

MUCH of the progress in photography can be directly traced to amateurs who gave their time and efforts to developing the means for making better pictures. This seems to have been forgotten in the past few years by the research laboratories of the industry who went ahead on their own, paying little attention to the findings and opinions of the amateurs.

In recent months, however, a sudden change has come about. In various forms the manufacturers are approaching the amateur to get his ideas on new equipment and on gadgets which make picture taking easier. They want to know what type of camera he would like to have, how many exposures he desires to a roll of film, and whether he is interested in making certain types of pictures which require special equipment.

This new trend is bound to be of mutual benefit. Photographers may see the causes for some of their pet peeves eliminated, and the industry will have the assurance that it is meeting the demands of its customers.

MANY readers have inquired when our *Glossary for Photography* will appear in book form. The *Glos-*

(*Continued on page 118*)

MANUFACTURERS! DISTRIBUTORS!

Popular Photography

is preparing a

DIRECTORY SUPPLEMENT

It will list, exclusively and completely,

NEW EQUIPMENT

which appeared on the market after the closing date of the May 1939 issue. Its purpose is to bring the Directory up to date before the Christmas buying season. All listings are free.

Wire or write us immediately for data blanks

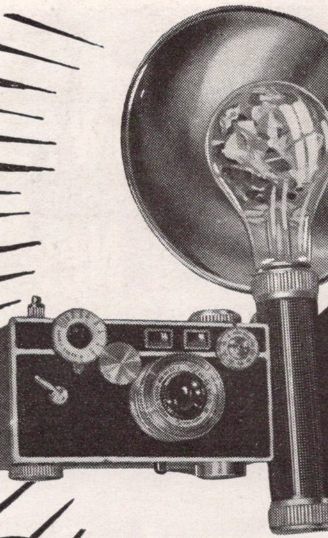
We have blanks for all types of equipment and materials

The Directory Supplement closes

SEPTEMBER 25th

All information must reach US before that date

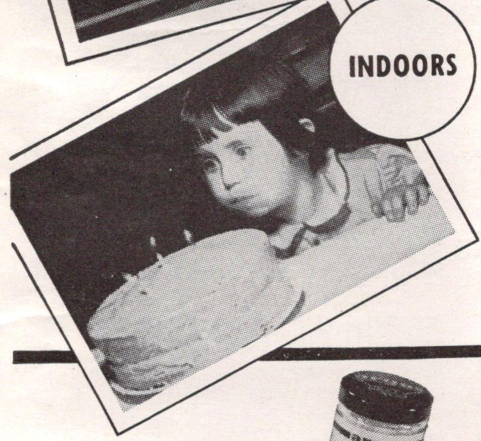
Snap BRILLIANT PICTURES in Any light!



$30
Complete with Attachments (less bulb)

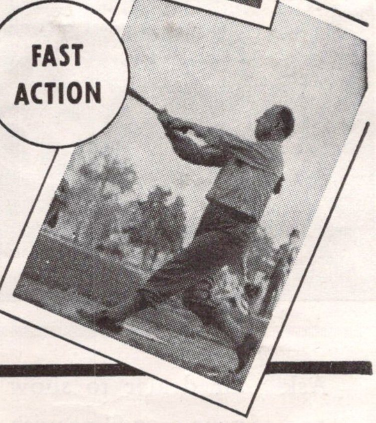
NIGHT SHOTS

INDOORS



PORTRAITS

FAST ACTION



new argus

SYNCHRONIZED FLASH CAMERA

Flash! And the picture's yours for keeps with the new Argus C3 Camera. Takes fast-action shots in ANY light! Built-in timer synchronizes flash and shutter speeds. Coupled range finder assures critical focusing from 3 feet to infinity. Has high speed f:3.5 "Cintar" triplet Anastigmat lens, fully color corrected. Shutter speeds range from 1/5 to 1/300 second. Uses 35 mm. film in standard cartridge.

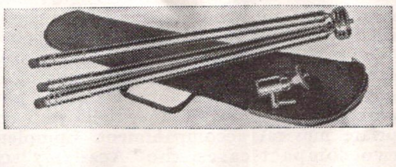
argus
A.R.1
FINE GRAIN
DEVELOPER

ARGUS DEVELOPERS

AR1 Fine Grain Developer for 35 mm. plates or films. One bottle of powder produces 1 quart of solution 70c

AR2 Universal Developer for contact or projection bromide printing papers as well as films. One bottle produces 1 quart 45c

AR3 Paper Developer for contact or projection bromide printing papers. One bottle of powder produces 1 quart of solution 40c



NEW ARGUS TRIPOD for all types of hand cameras. Adjustable screws maintain tension in head. Rigid tubular construction; chrome plated. Length when folded, 14½"; extended, 41¾" $4.75

Swivel Head $1; Carrying Case $1.50

ARGUS BROMEX PAPER

A versatile projection printing paper having a full scale emulsion, assuring rich, brilliant enlargements and a wide range of halftones—with any printing equipment. Extremely rich in silver, exceedingly fine grained. Soft, medium, hard; glossy, semi-matt, silk; 2¾ x 4¼, 5 x 8, 8 x 10. In single and double weight. Priced from **35c** to **95c**

ARGUS CANDID CAMERAS

IN FIVE OTHER MODELS FROM $7.50 TO $25

SEE YOUR LOCAL
ARGUS DEALER
OR MAIL COUPON

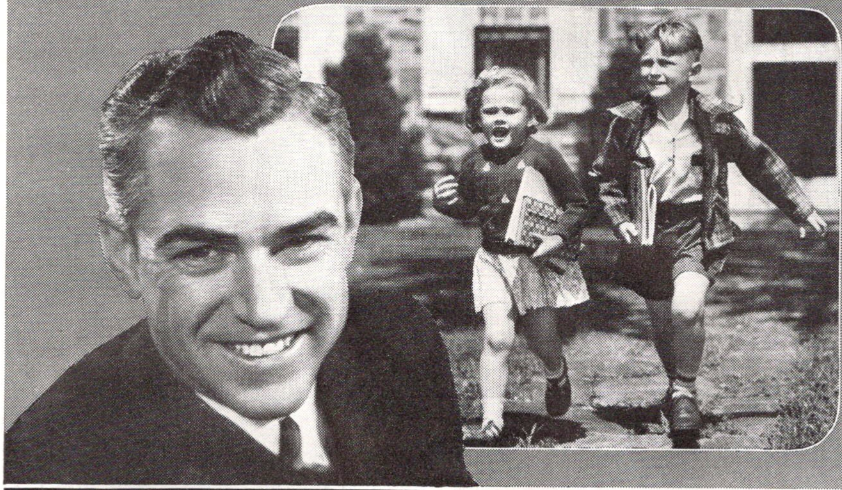
International Research Corporation
326 Fourth Street, Ann Arbor, Michigan

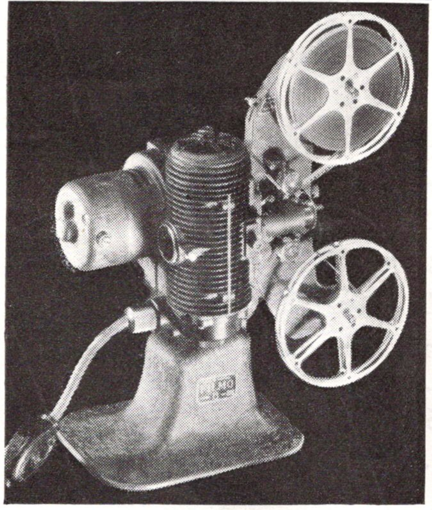
Please send me complete information on Argus Model C3 Camera, new Argus Tripod, Developers and Argus Bromex Paper.

*Name*____________________

*Address*____________________

"Yes, My Movies Do Look Much Better Now... I Have a New *Filmo* Projector"





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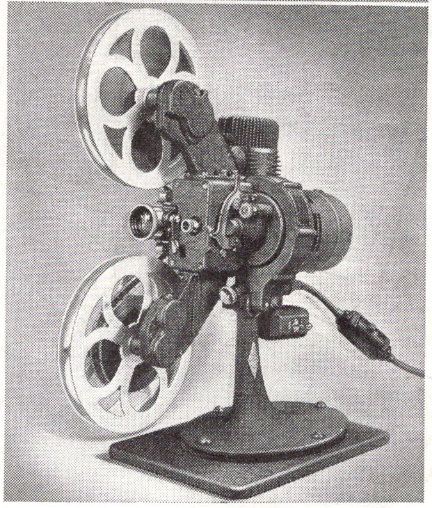

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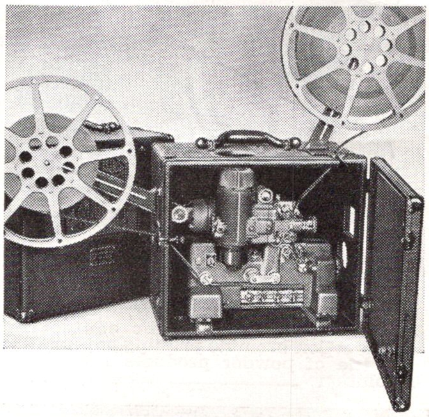

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OCTOBER
1939

VOLUME 5
NUMBER 4

Popular Photography

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Contents

Debunking Spirits with Infra-Red 14
Creating Designs with Your Camera 17
Odd Pictures with a Wide-Angle Lens 18
Give Your Child a Camera 19
Photomontage Tells the Story 20
Make-Up for Color Is Different 22
Color Meets the Deadline 24
Snap Men as They Are 26
Hunting with Flashpowder 28
Photography in Cap and Gown 30
Toni Frissell—Outdoor Specialist 32
How Fast Is Your Film? 34
A Farewell to Dust 36
Ask a Fair Price for Your Pictures 38
Point of View Makes the Portrait 51
So You Want to Take Pictures for Advertising 54
Sound in Your Movies 57
Meet Your Meter 59
Project Your Favorite Black-and-White Shots 60
An Efficient Printer for Positive Transparencies 61

Candid Shots by the Editor 10
News Pictures of the Month 37
There Is Money in Picture Post Cards 56
Picture Analysis by Nicholas Ház 58
Pictures from Our Readers 62
Night Action Photos Are a Cinch 64
History of Photography—Cartoon 64
Print Criticisms 65
Questions and Answers 66
Letters to the Editor 66
New Tricks for Camera Owners 67
Trade Notes and News 68
Calendar of Photographic Exhibitions 68
What the Camera Clubs Are Doing 70
Notes on the Salon Section 72
Simple Lens Attachment Gets "Spook" Effects 74
Eveready Camera Harness 76
Prize Contests and Markets 120

Salon Section

SUMMER IN HOLLAND by J. F. Abbott 39
CORN by J. W. McManigal 40
WINE by Relang; José Alemany 41
BALLET RUSSE by George Leavens 42
FOX HUNT by John H. Vickers 44
FLIRTATION by George A. Thompson 45
ILLUMINATION by Frank Cleveland 46
TIGERS by Martin Munkácsi 47
PORTALS by George Hukar; Robert McCullough 48
CONNOISSEURS by Bernd Lohse; M. Arthur Robinson 49
PHOTOGRAM by Fred G. Korth 50

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ZIFF-DAVIS PUBLISHING COMPANY

A picture by Will Connell whose story on double portraits will appear in the big November issue.

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Andrew B. Hecht, Ph.D., Managing Editor
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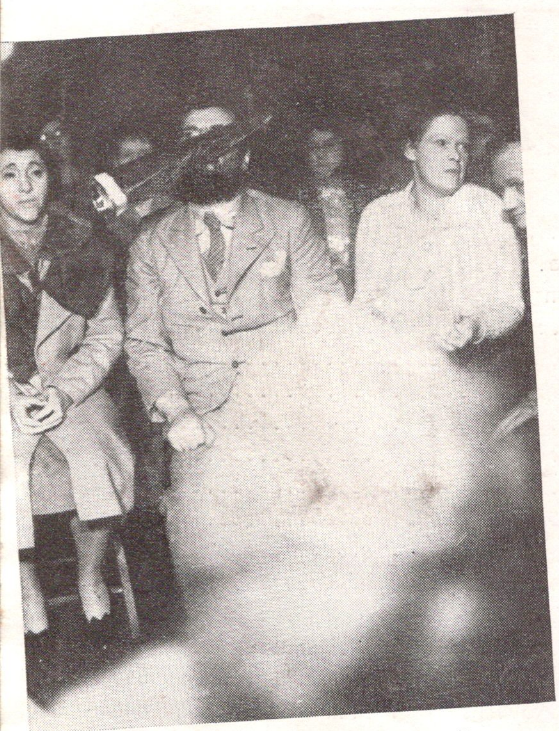
Debunking Spirits with INFRA-RED

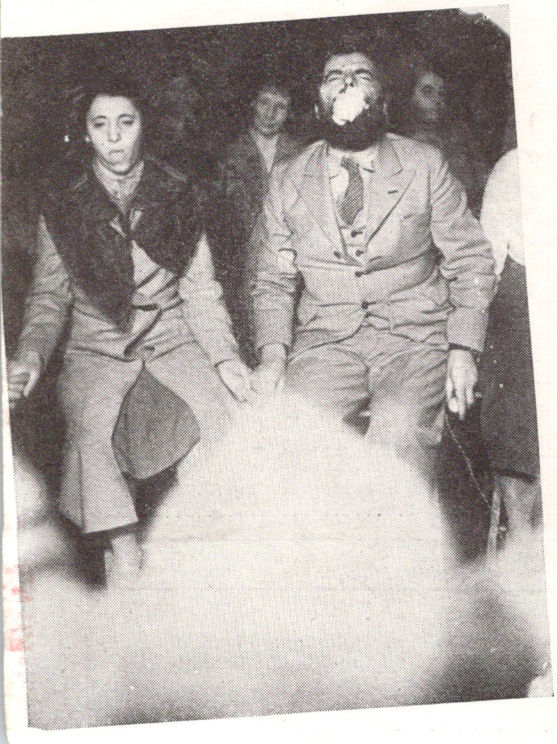
By DR. NANDOR FODOR

Former Director of Research of the International
Institute for Psychical Research, London, England

To check the claims of mediums, the author photographed their psychic phenomena in darkened seance rooms with infra-red flash.



These two infra-red pictures exposed a medium who claimed to materialize a spirit substance referred to as "ectoplasm." The "ectoplasm" issuing from his mouth in the lower picture is obviously the handkerchief which appears in his breast pocket in the picture above. As his hands were held he picked it up with his mouth.



FOR many years the study of "psychic" phenomena presented by mediums was hampered by the fact that seances are usually conducted in totally dark rooms. Observation under such conditions, of course, was almost impossible.

With the advent of infra-red film, with which pictures could be taken in the dark, an entirely new and exciting field of inquiry was opened. I set myself to the task of developing practical methods whereby photographic studies might be made of the activity in the seance room. The problem was not an easy one and success came slowly. And now perhaps you would like to know why the studies were made.

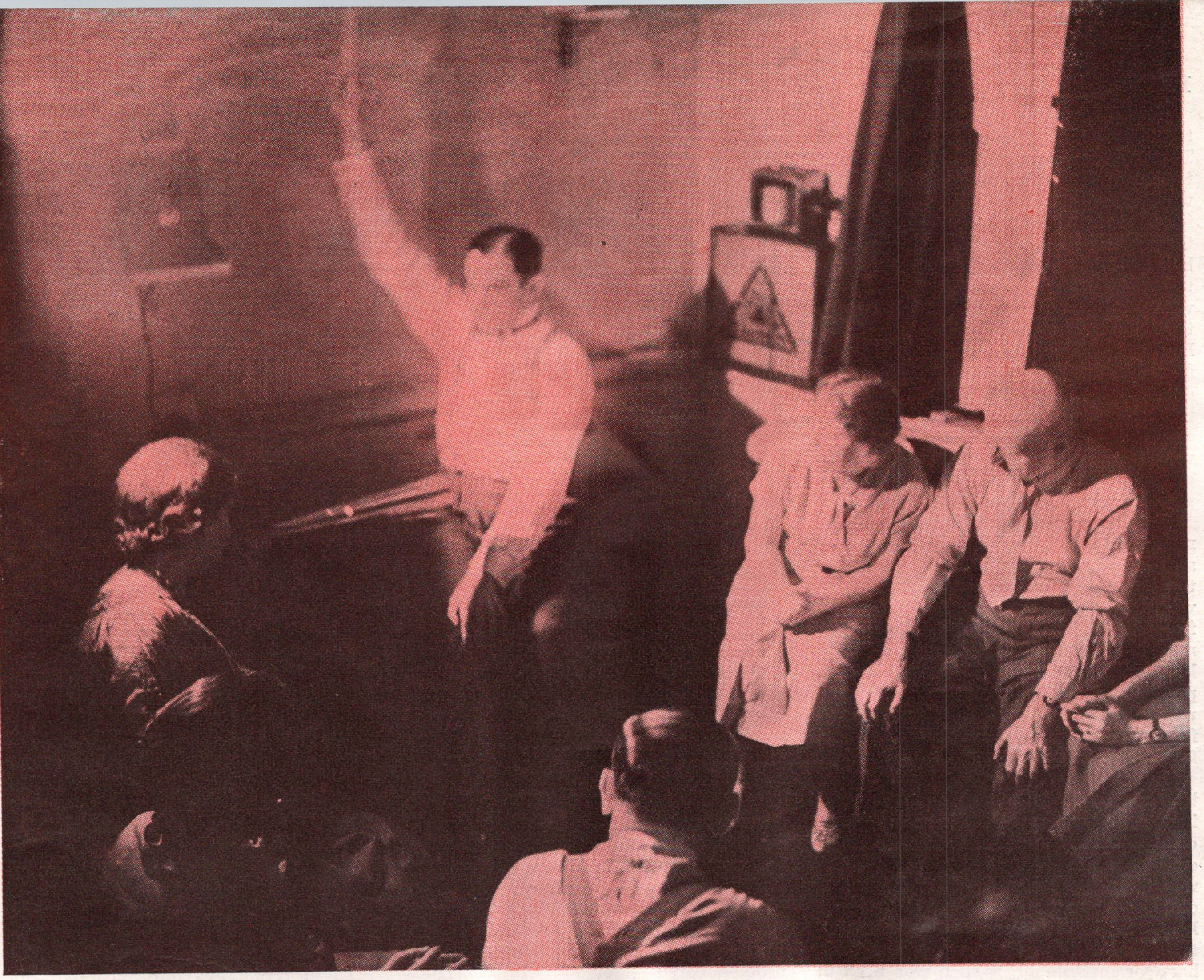
I have been Director of Research of the International Institute for Psychical Research, London, for the last four years. My job was to investigate, by all means at the disposal of science, the strange claims made by spiritualistic mediums, and the odd spontaneous phenomena (like telepathy, premonition, clairvoyance, visions, apparitions, etc.) that may occur, from time to time, to people who have no reason to call themselves "psychic."

Amongst the claims made by spiritualistic mediums the so-called "physical" phenomena have been a challenge to science ever since modern Spiritualism began in America with the "Rochester knockings" in 1848. It is being said that mediums, or the spirits working through them, are able to move objects at a distance without contact (telekinesis), that they can raise themselves in the air without support (levitation), that they can exude from their body a protoplasmic substance of strange properties (ectoplasm), and that from this substance, by some mysterious process, human limbs, nay, complete human bodies with all the attributes of life can be built for the purpose of manifestation (materialization).

You may say that such claims are absurd. Remember, however, that absurdity never prevents a fact from occurring; also that there have been famous scientists in the past and in the present century who concluded that these things do occur. These people were trained observers, they introduced measures of stringent control and used recording instruments, amongst which cameras were always in profusion. The photographs taken by Sir William Crookes between 1871-74 of "Katie King" (the beautiful spirit daughter of Sir Henry Morgan, the buccaneer) are still widely referred to in every book on psychic phenomena. Nowadays, however, comparatively few mediums submit themselves to flashlight photography. They claim to be extremely sensitive to light. They say that the sudden flash disrupts the phenomena, gives them a painful shock, and might seriously injure them by driving back too suddenly into their body the exteriorised ectoplasm. He who knows the sudden effect of blinding light on a sleeping man may well understand that these complaints of trance mediums may rest on serious grounds. On the other hand darkness provides an excellent opportunity for deception, and unless you have a photographic record for examination how can you be sure that the white mass which you see floating about in the dark is not a few yards of muslin or cheese cloth which the medium smuggled in?

With the coming of infra-red photography it appeared that the much-mooted problem of the reality of spiritualistic phenomena was near to satisfactory solution. If photographs could be taken without a white flare, the medium could be saved from the shock of sudden light, the phenomena would not be interfered with, and the investigator could check his observations with pictorial evidence.

There were, however, no experimental data extant as to the use of infra-red plates and illumination for seance room purposes. At the time I began to be pre-



The trumpet in the picture was supposed to have floated in the air without support and "spirits" supposedly spoke through it. But note the medium's thumb supporting the trumpet. The infra-red flash went off automatically when the trumpet crossed a preset infra-red beam.

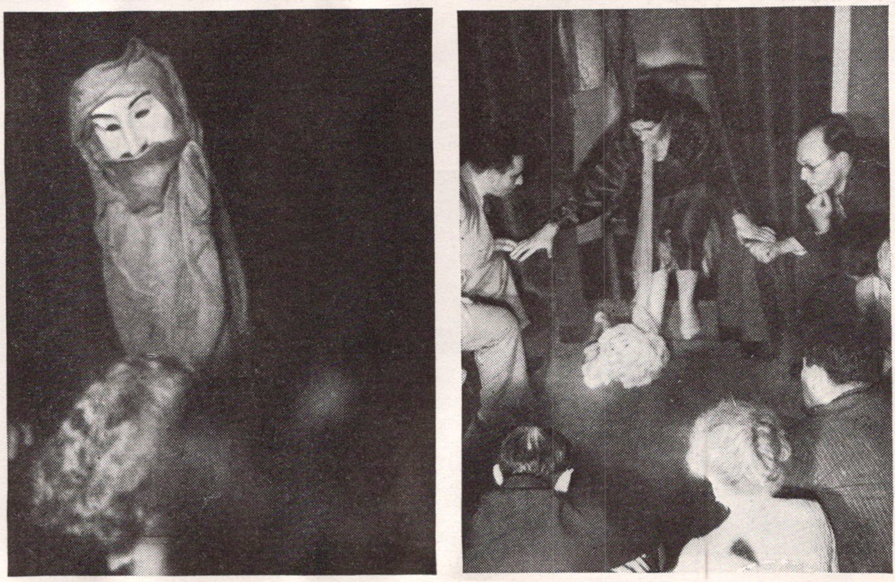
occupied with the problem, infra-red plates were only used in daylight to take photographs through fog and mist. They helped the photographer to add distance to his pictures under conditions that were considered adverse and impossible before. Nobody wanted to take photographs in the dark. There seemed to be no real need for it. As a matter of curiosity, some people had exposed cameras loaded with infra-red plates in a darkened room to the heat of a hot electric iron. The cumulative effect of the heat rays was sufficient to "illuminate" the room for the infra-red plate and gave a fair exposure in about an hour.

But this was mere playing about with this new development in photography. To make it valuable for seance room purposes, instantaneous exposure was necessary and red visibility had to be reduced to the minimum with maximum actinic effect. Flashlight bulbs alone supplied the necessary energy. I experimented first with the baby size Sasha light by placing it in a light-tight box which had an Ilford 8 x 10 infra-red filter in front, and fired it with an 8-volt battery. The duration of the flash is given by the manufacturers at 1/75 second. Behind the infra-red filter the flash was a faint red flare which cast no shadows. The room remained in darkness and he who had his back to the flashlight box was not even aware that a photograph was taken. The picture was underexposed but good enough for purposes of study. So the problem was essentially solved.

How perfect the photographic record would be depended now on the medium's tolerance of the strength of the red flash. The second size in Sasha lights, the standard, gave a good exposure; two standard lights in two synchronized boxes to cut out unwelcome shadows (as used in my experiments with Fru Lara Agustsdottir, the Icelandic materialization medium) gave a perfect photograph. The price to pay was an increase of momentary red visibility. The medium, if not in trance, was made conscious of the flash.

These shortcomings were not sufficiently serious to interfere with my research work. A good deal of coaxing was necessary before any medium agreed

The first infra-red picture shows that a "spirit" is really a mask pinned to a curtain. The second picture reveals how the medium made it "disappear" through the floor. In the semi-darkness she dropped the mask and drew it into the cabinet with her foot.



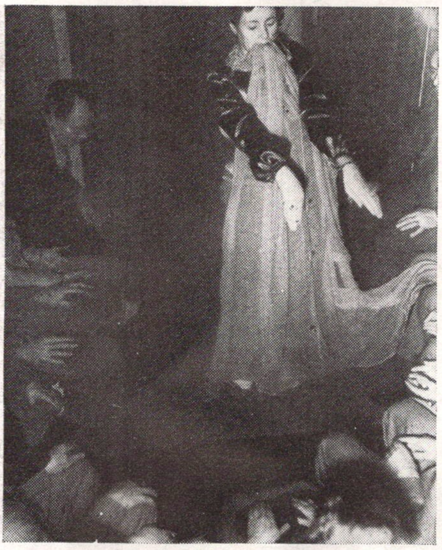
to being photographed by infra-red. They were very suspicious. They wanted to see what infra-red did and they wanted to control the moment when the flashlight went off. Often they insisted that the lead of the flashlight box should be in their hands and they, or the spirits using their body, should fire the flash when the moment was opportune. Sometimes there was logic in these requests. If, in complete darkness, a medium rises from his chair and floats about the room, one may not know that the moment is at hand; but the alleged "spirit control" would know, and by firing the flash at the right time could secure a good photograph—or successfully conceal factors which might give the secret away.

Notwithstanding such limitations I was making steady progress, searching constantly for ways and means to improve the technique and to find subjects that would give greater freedom. One of my favorite ideas was to make the flash automatic so that there should be no time-lag between a psychic occurrence and its photographic record. I constructed apparatus which, as soon as it was interfered with, closed an electric circuit and fired the flash.

If, for instance, the medium claimed to be able to make a small trumpet float in the air unsupported (for the purpose of making spirits speak through it) I could make the flashlight go off automatically as soon as the trumpet moved or reached a certain height. On this area I focused my cameras in advance so that the photographs should show a human hand or instrument, if such was used in raising the trumpet.

At one time I combined the flashlight box with an infra-red burglar alarm. It was the commercial type which guards jewels at exhibitions with an invisible ray. If an interruption of the beam takes place, a bell rings. I disconnected the bell and placed my flashlight box in the circuit. If the trumpet would cross the beam at a certain height the flashlight would go off automatically and the photograph would duly show what had taken place.

It showed it only too well. The medium who was tied to her chair succeeded in getting hold of the trumpet and was speaking through it. Her "spirit control," a Red Indian, was not sufficiently astute to spot what was happening.



The medium supposedly exuded a flow of "ectoplasm." But the infra-red picture showed that the "ectoplasm" was really a curtain which was readily identified by its hem and several holes that showed.

I have already indicated that ideal infra-red photography, for seance purposes, would necessitate the complete elimination of the visible part of the red flash and the masking away of the heat effect. With infra-red energy from flashlight bulbs this cannot be done. In the proportion that the strength of the flash is reduced we get less light and heat but also poorer results. Theoretically, I was assured by my science assistants, the problem could be solved by the construction of a big concave reflector with a network of wires, perhaps of a total length of a quarter of a mile, kept below glowing intensity. From one or several such reflectors, suspended above, enough heat would emanate to keep the seance room comfortably warm in the winter and would light it up with sufficient invisible "light" for instantaneous exposure on infra-red plates. With noiseless camera shutters such an arrangement would enable psychical researchers to take photographs without the knowledge of the medium.

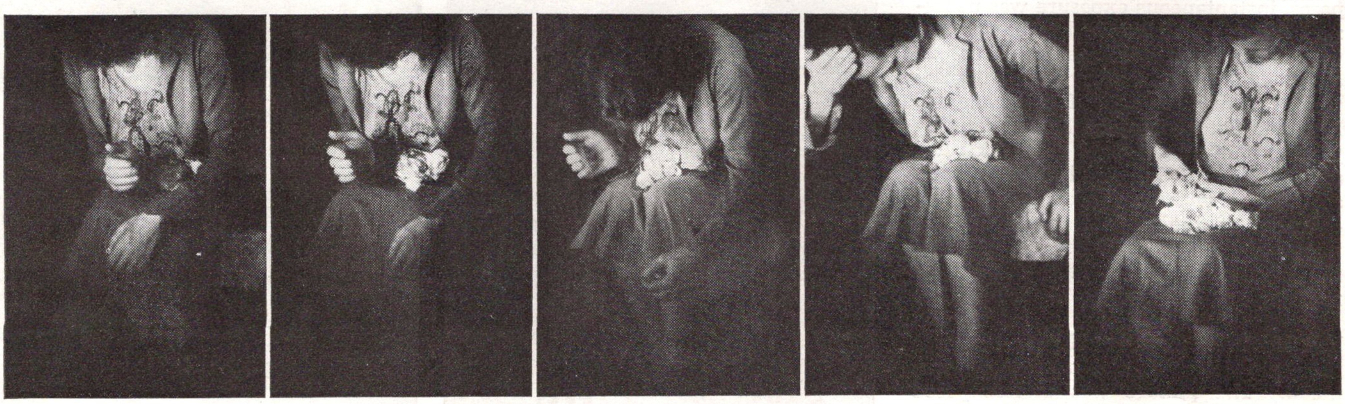
The same arrangement would be ideal for infra-red cinematography. I was the first man in England to shoot motion picture films of seance phenomena by infra-red. The difficulties were considerable. Constant red illumination could only be provided by high-power bulbs. But if the lamp was too powerful, it melted the gelatin of the infra-red filter. If it was not, the energy was on the low side. A 1000-watt lamp would begin to damage the filter in about four minutes. Air-cooling proved to be too complicated; heat-resisting glass between the bulb and the filter was practicable but absorbed a good deal of energy.

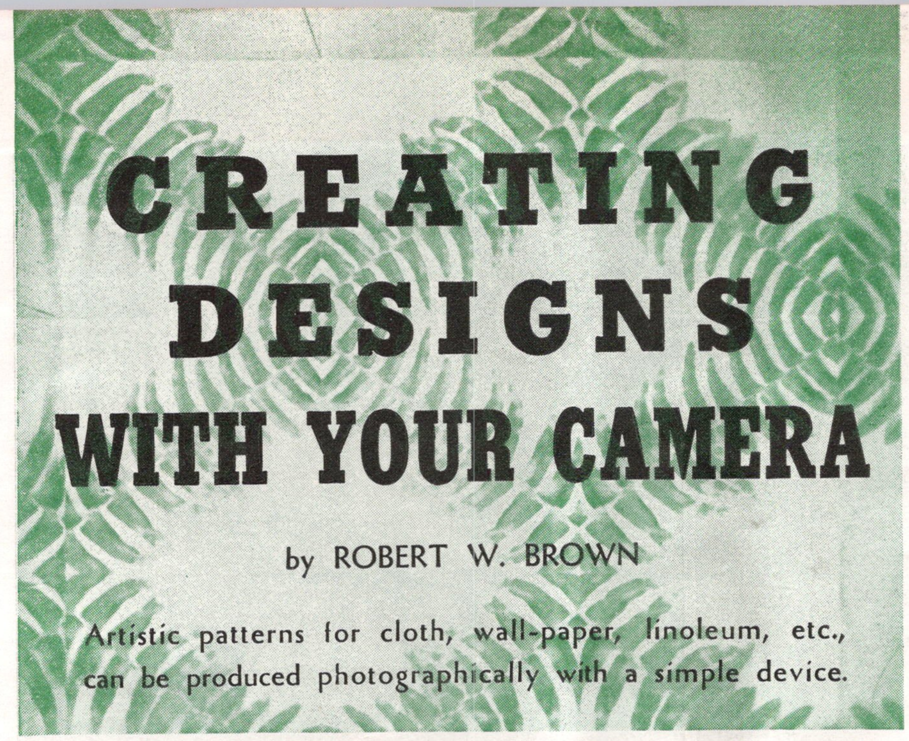
An increasing number of less powerful illumination boxes provided the best solution. Five boxes with 500-watt lamps that were overloaded (with a powerful army searchlight reflector behind them) gave enough energy for an underexposed but useful film of about sixteen exposures per second, and the filter could stand the heat for thirty to forty minutes. The visible light and the heat, however, was so considerable that the shooting of the film could only be attempted in exceptional cases. Miss Hylda Lewis, "the flower medium" was one of such exceptions. She claimed to give "birth" to flowers in daylight. The flowers appeared first as a bulge behind her back or under her armpit. The bulge gradually moved forward and from under her jacket suddenly a bunch of flowers peeped out. As she was used to sitting in daylight, the light of the infra-red lamps did not disturb her, whereas the glare of the white lamps would have. The film, though underexposed, plainly showed that the flowers were suspended under her left armpit and were pushed forward by bodily convulsions, possibly also by the use of a dark thread.

These researches into infra-red photography have brought me more disappointment than joy. The photographs, in almost every instance, have effectually disposed of the claims of the mediums I was investigating. This alone, of course, proves the utility of this approach to the problems of spiritualism; but it leaves the question open whether infra-red photography would help to establish the claims of genuine mediums. It may be argued that mediumistic structures are composed of a cloud of material particles that reflect the visible red rays and thus become perceivable to the eye but remain transparent to the longer waves by which the flash exposure is made. The absence of photographic confirmation would then only prove the shortcomings of the method employed!

(*Continued on page* 88)

This series of infra-red photographs exposed a medium who claimed to produce flowers from "heaven." The pictures revealed that flowers were brought forth from under her coat. Movement of right hand and head indicates that a thread or strand of hair was tied to the flowers.





CREATING DESIGNS WITH YOUR CAMERA

by ROBERT W. BROWN

Artistic patterns for cloth, wall-paper, linoleum, etc., can be produced photographically with a simple device.

CREATING designs with a miniature camera which are suitable for commercial purposes is probably the one item that today is farther from the thoughts of camera fans than any other. But that is only today. Tomorrow is another matter, and to emphasize that point Harrie V. Schieren, New York amateur photographer, has just patented a device for producing designs with any standard miniature camera which quite possibly may presage the opening of a new field of photographic endeavor.

In his quiet office in one corner of the Schieren Building, where as president he daily directs the affairs of the leather business his father founded in 1868, I located Harrie Schieren and asked him to tell the readers of POPULAR PHOTOGRAPHY about the tube he had invented, and the work that could be done with it.

"Really, there's not much to say," Mr. Schieren, a soft spoken, gray-haired man in his late fifties, told me. "I've devoted the greater part of my spare time for the last ten years to working on the Schieren Tube. Now it's just about ready for marketing, and I think that it speaks for itself. I'll show you."

From a nearby file he withdrew a folder and passed me a single print. It was an enlarged copy of a drawing of a single flower of the most elemental sort.

"Now look at this," he said, passing over another print.

There, repeated over and over in a plain but simple pattern, was the flower motif he has just shown me.

"Did you do this with a miniature camera and your tube?" I asked. He nodded.

"That is an example of the basic principles of all designing—the uncomplicated repeat motif," he said. "I showed it to you just so you would understand what many forms of design are based upon. Now look at these."

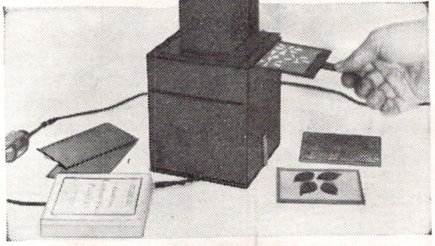
From the folder he withdrew other prints and passed them to me in a bewildering stream of original pictures and the designs that had resulted from his work with them. The results were astounding. From simple themes such as a clump of grass, a few oak leaves, a group of flowers, designs had been created that packed a punch and really were beautiful to look upon.

"Those are just a few samples," he said casually when the last was put aside. "The possibilities from any single carefully chosen motif, when handled through the Schieren Tube are unlimited. Everything depends upon the ingenuity and artistry of the worker. Technically there's nothing to producing these designs. I think that I could do it in my sleep now, if I had to, and I'm certain that any other amateur photographer, once he really understood his equipment and became interested, could do the same.

"Here," he rose and led me to a nearby table. "I'll show you how it's done."

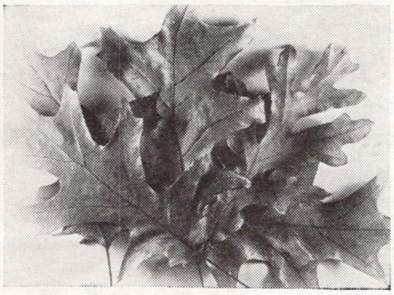
The setup used in producing the designs stood upon the table. At first glance any photographer would have said that it was some sort of copying stand, and in a sense it is. But fundamentally it differs from most regular stands. Instead of having a flat base from which the upright post holding the camera rises, this stand has a small box-like base about six inches deep and four or five inches square with a light inside the box, and a ground-glass window in the top. The camera, held by a stout arm from the upright, is centered directly over the window. Clamped to the camera lens, and projecting down to within a fraction of an inch of the glass, was the Schieren Tube, a sturdy-looking bit of glass tubing, painted black, about six inches long and two inches square.

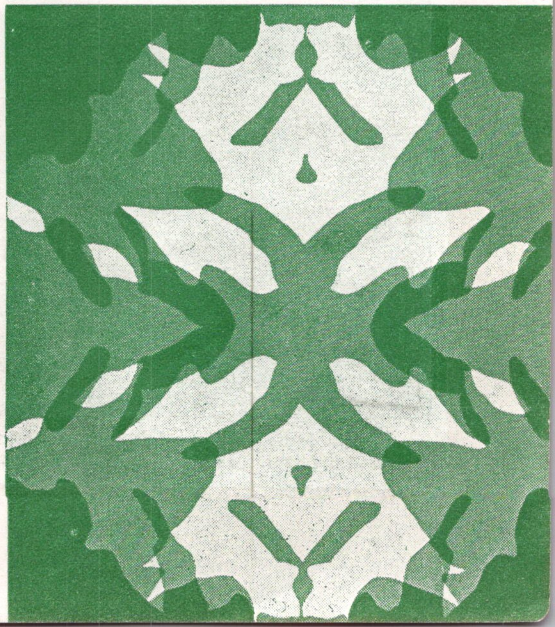
(Continued on page 92)



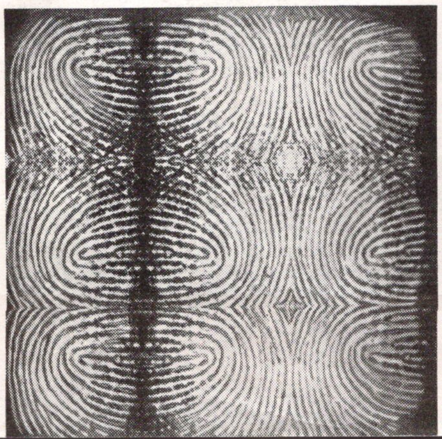
Above is the Schieren Tube with a camera attached, and a transparent design slide.

Directly below are the leaves from which the pattern at the bottom was created.

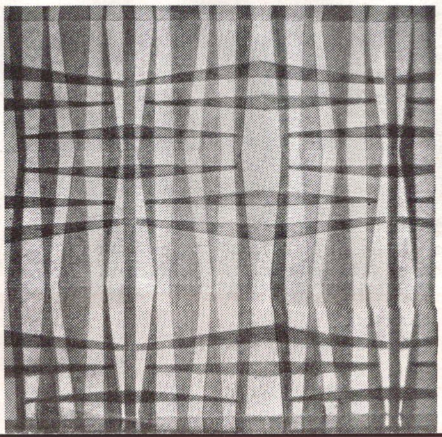


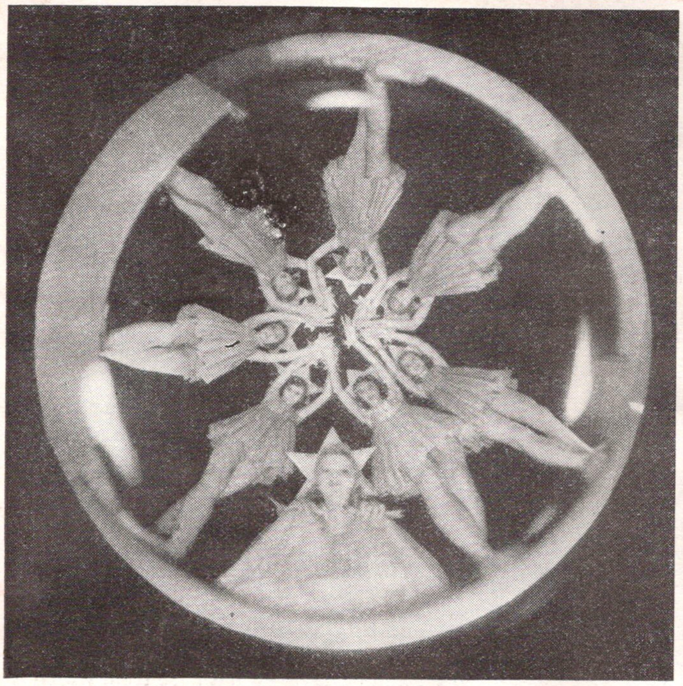


A thumb print supplied the motif for this design produced with the Schieren Tube.

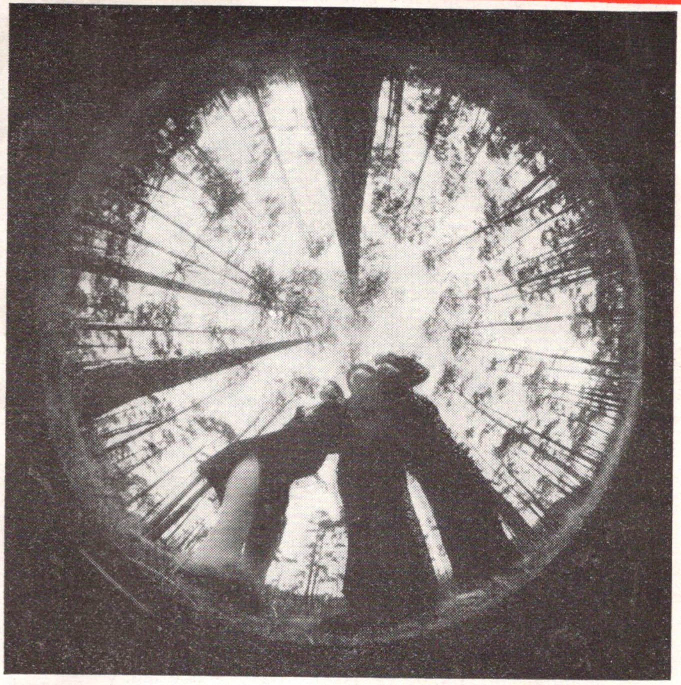


This original design is a repeating motif resulting from overlapping tracing paper.





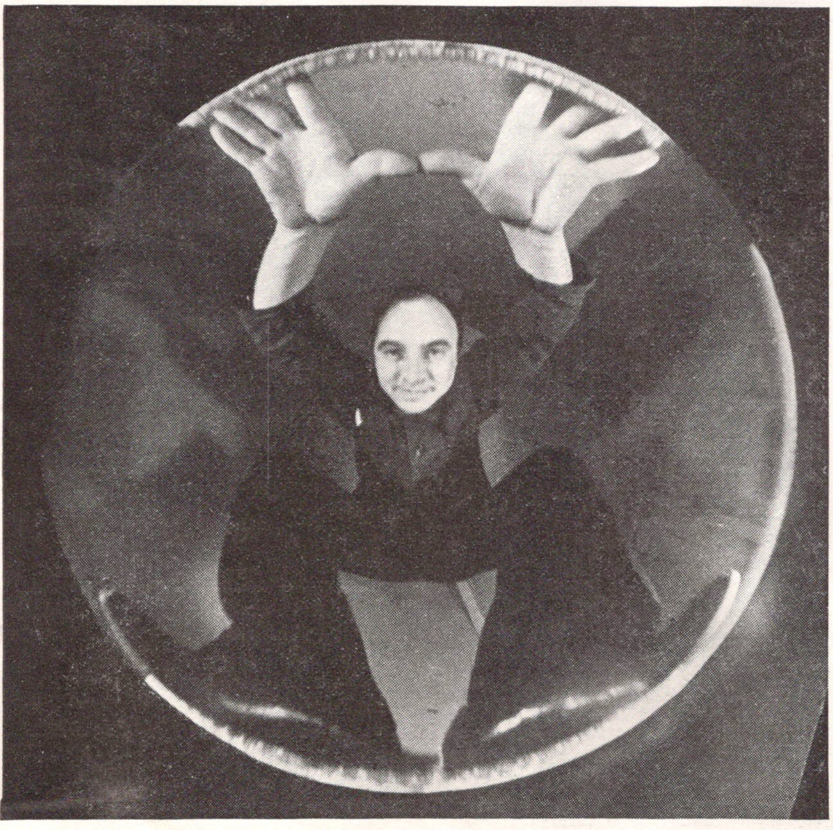
While the special wide-angle lens was not designed for taking pictures like this, it illustrates the amazing coverage of the lens.



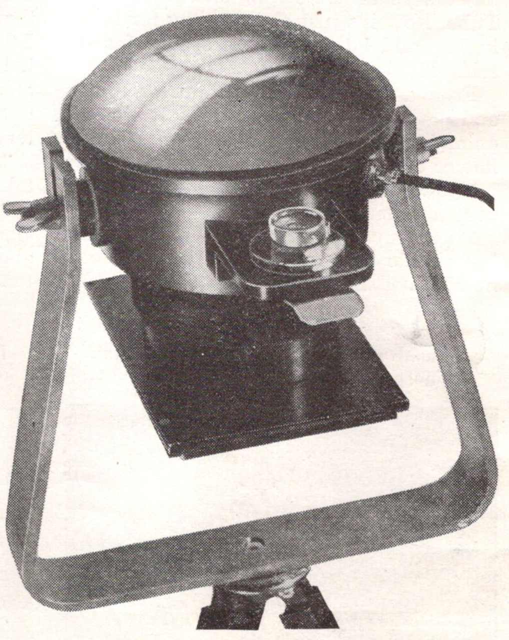
Another view taken with the lens out-of-doors. The camera was set on the ground, yet objects on the ground are visible in the print.

ODD PICTURES WITH A WIDE-ANGLE LENS

Created for scientific purposes, the amazing wide-angle lens illustrated below embraces an angle of slightly more than 180 degrees. The human eye and extreme wide-angle lenses take in an angle of only 90 degrees. Several hemisphere-shaped lenses make up the complete wide-angle lens shown here. When the camera is set on the ground, with the lens pointing upwards, the angle of view takes in the ground just a short distance from the camera lens.



The photographer took this unusual picture of himself in a crouching position over the lens. The lens was above floor level yet his hands and feet show.



The lens and camera which was designed for photographing the whole sky at once.

A healthy interest in pictures may keep your child from undesirable activities.

GIVE YOUR CHILD A CAMERA

By ANGELO PATRI

Consulting Educator, Patterson, N. Y.

One of the most famous of child psychologists gives you his views on the part a camera can play in developing your child's character, forming good habits, suppressing the bad.

EVERY family needs a camera. It is as much a part of the household equipment as the stove and the broom and the baby's crib, and as useful. One of the essentials of a modern home is a record of the children's growth, a history of the family life as it develops from year to year. There is no clearer, more accurate record possible, nor any as interesting, as the one the camera sets down.

Unlike many other useful tools, the camera is easy to carry about. It can be carried in one's pocket, fitted into the corner of a suitcase, or carried slung across the shoulder ready for instant service. This makes possible its universal use, makes it the ever-present, ever-seeing eye of press and public which it has come to be. The perfected lenses work miracles, the miracles which attract and hold Youth in wide-eyed enthrallment. Anything which can do that for our younger generation is worth more than a passing thought.

In these days of speed and noise and overstimulation of every sort, our young people are likely to become shallow-minded, interested briefly in what thrills for the moment, then eager for the next noise and the next hurry-up party. They miss the rich and enduring experiences that nature and her ways offer those who give themselves to her instruction. "What's to do there? What can you do in the country? There's nothing doing." That attitude which implies ignorance of the fundamental joys of life is dangerously close to becoming national among our youth.

It is dangerous because a generation who have no understanding of the peace of the night, the beauty of sky and sea, the flickering of light and shadow in patterns on the wood's floor, the grace of a posed deer, the slim beauty of a bird, are blind and deaf to the beauty of life in most of its aspects. They will have missed the feeling of belonging, of sharing and triumphing over difficulties that enrich the mind and nourish the spirit of a wholesome human being.

The hurry and pressure of life to-day make relief a necessity. The motor car has shortened the distance between the shop and rest in the peace of the open. When a father and mother pack the car, load in the children and the dog and the picnic outfit, fishing rods, and camera, they are doing the one thing likely to save their health and nourish their souls.

Children need association with their fathers and mothers in hours of recreation. But there must be "something doing" between them to make that association pleasant and keep it something greatly to be desired by the children. Fishing with father, boating with mother, and taking pictures with both, make the joy of the occasion complete.

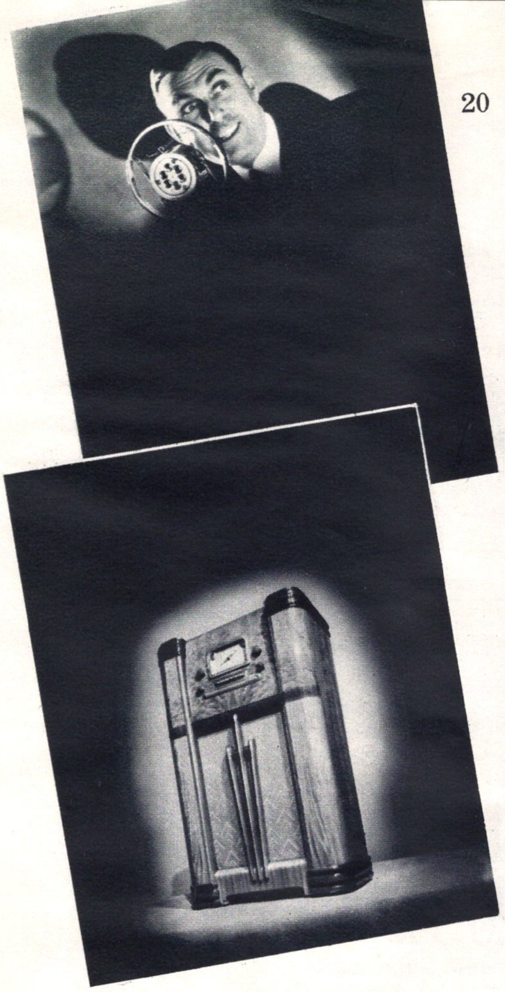
Photography as a hobby is common among children the world over. Here two Dutch girls are making a photographic record of a long-to-be-remembered trip to London. Your child will find similar uses for his camera.

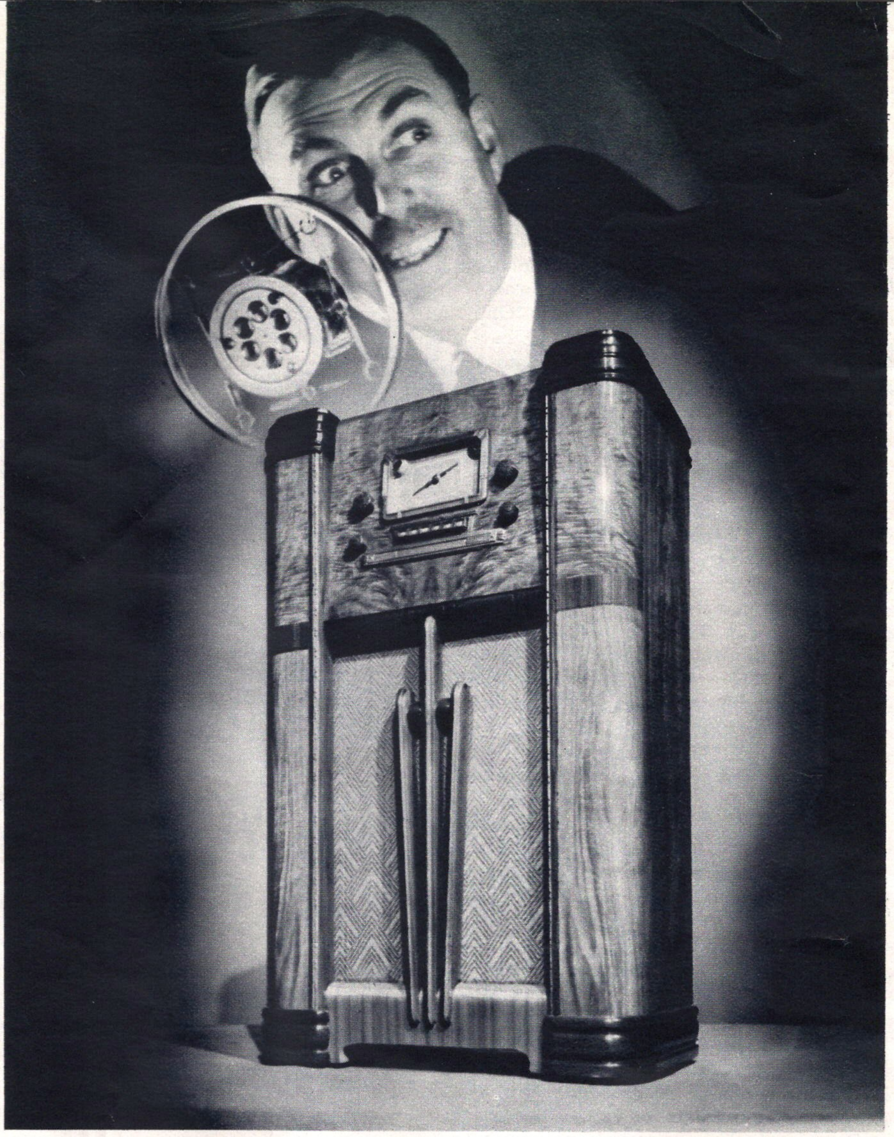
It is better to teach a child to use a camera to catch the beauty and grace of an animal than to teach him to use a gun to kill it. There is nothing to be said for the people who hunt to kill. There is everything in favor of the one who hunts to learn, to enjoy, and to love. When a young person learns to enjoy getting a good picture, making a real study of his subject whether it be a cloud or a wave, a bunch of grass or a fleeing deer, he has come close to feeling and understanding the secrets of nature. He has touched the poetry of life and come close to knowing beauty. The true beauty of any aspect of life is the true aspect of it. "Truth is beauty and beauty, truth."

If fathers and mothers could only know the values that their children can get out of first-hand acquaintance with a good camera, no child in the land would be without one. No child ought to be. Taking pictures for records, for study, for Art's sake, for fun, ought to be a family practice as common as driving the car.

There is another reason for using a camera, one I hesitate to talk about and

(*Continued on page* 116)





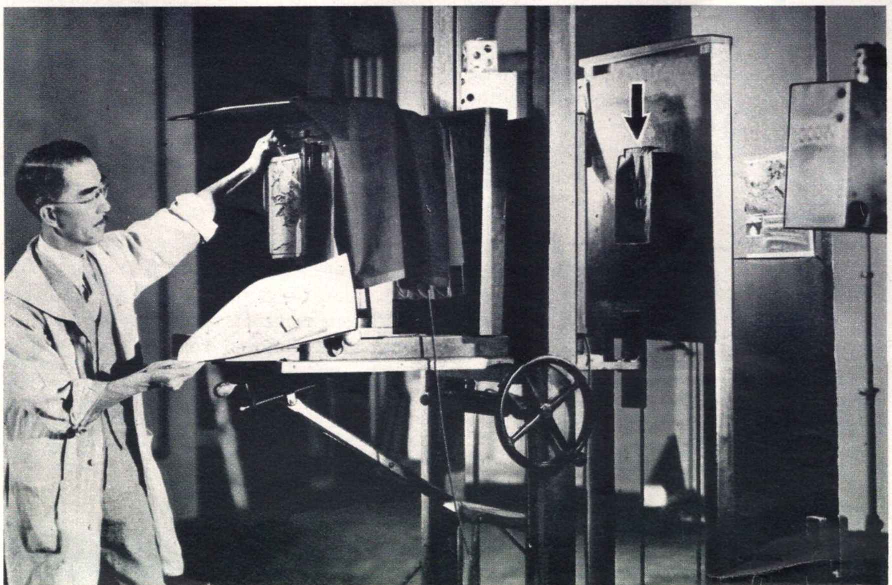
Above are shown prints from two negatives which were superimposed and printed simultaneously to produce the effect at the right. Through this method a single print can strike the keynote of a sales message. The product in this case is a Montgomery Ward radio set.

PHOTOMONTAGE

By HARRY K. SHIGETA

Photographic Illustrator, Shigeta-Wright, Inc., Chicago, Ill.

One of the country's most expert photographic illustrators, the author excels in montages. Here are his instructions on how to make them.

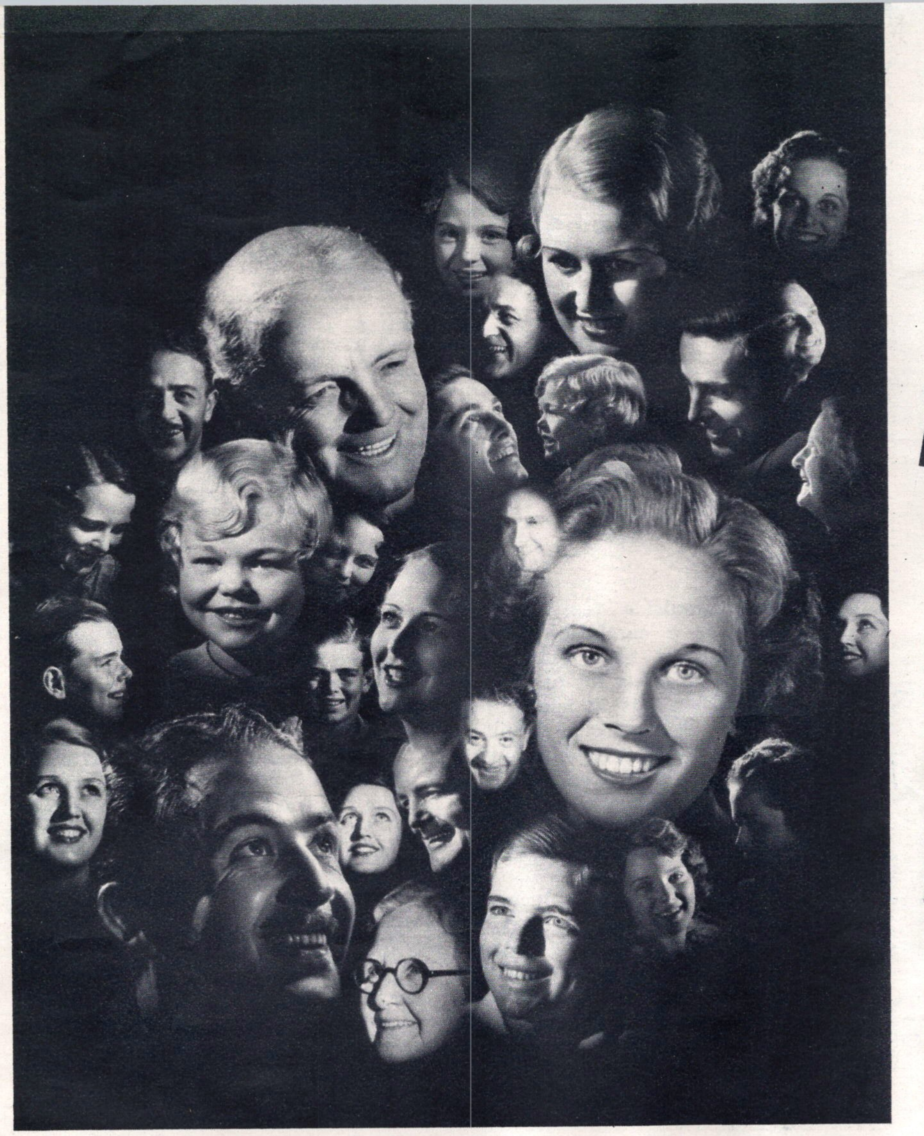


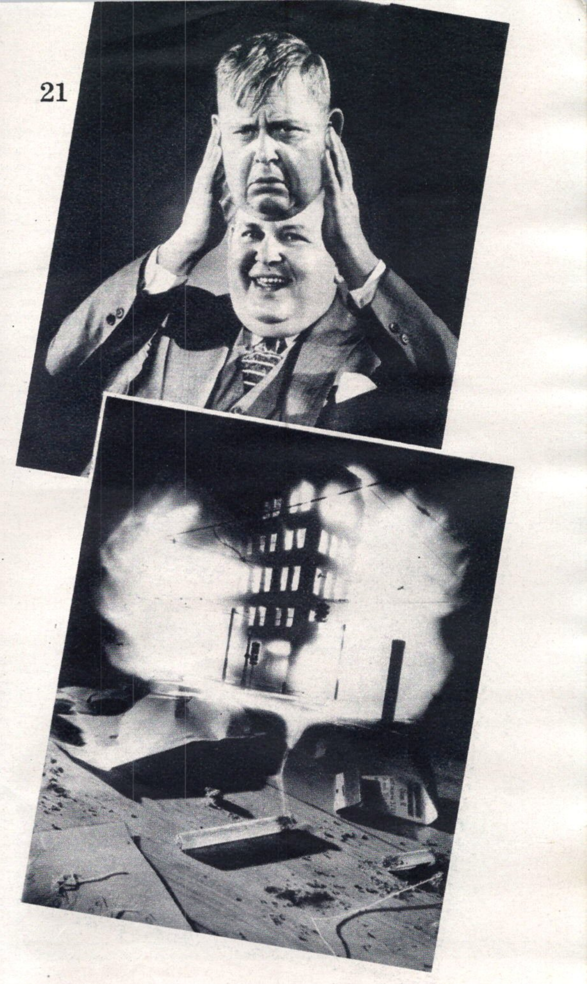
The author studies a working sketch as he makes a montage on a single negative. Arrow points to mask. Note the inked-in areas on the groundglass of the camera.

WITH the tremendously increasing popularity of the photomontage, this form of photography is being attempted by many who previously did not realize its possibilities.

Photomontage is ideally adapted both for pictorial purposes and for commercial illustration. In any case, the montage may be used to combine in one print several ideas which could never be so effectively illustrated individually. Whether the purpose is to create a pictorial masterpiece or a merchandising presentation—the thought and the technique involved will follow similar patterns.

There are no rules for the selection of the material to be combined into montages, this being one of the most accessible of photographic mediums for highly original and imaginative work. In fact, the photomontage permits the photographer to violate all sorts of accepted notions in





Top picture is a paste-up montage. Below it, a still life and a print (fire scene) recorded on one negative; the smoke was airbrushed. Left: several live models photographed on one film. Work done for Peoples Gas Co., Lumbermens Mutual, and Dr. West, respectively.

TELLS THE STORY

order to convey forceful, striking impressions.

Photomontage work is not too complicated for the average amateur photographer. I shall discuss three of the simple methods commonly employed in making this type of print. Choose the one that best fits your facilities.

Take the pictures or choose negatives with the part each is to play in the finished print kept well in mind. This helps you to plan the relative importance of each subject, and assures you that each image will have sufficient negative area surrounding it. This area furnishes space for blending into adjacent parts of the montage, or for fading out, without impairing the clarity of the individual subject. If the figure or object occupies too large a portion of the negative, you will have difficulty blending it into the finished work. If the lines where the various images join are not subtle, the photomontages will be a failure.

The commonest error in the making of photomontages is an improperly planned layout. To avoid either blank or too closely overlapping areas, prepare a preliminary sketch as a guide. This should distinctly define the amount of space to be allotted each picture and should be as nearly as possible the same size as the proposed print. The montage can't be effective if it is haphazard.

Probably the simplest method of doing this sort of work is the printing of various pictures directly on enlarging paper. Under the rays of a safelight, the paper is marked faintly with a pencil to designate the area upon which the image is to fall. A mask is held about midway between the printing easel and the enlarger lens and moved slightly throughout the time the exposure is being made in order to diffuse and blend the edges into the remainder of the montage. This is effected in much the same manner as ordinary dodging is done. The mask, of course, is cut to the proper size and shape to permit the desired image to pass through at the distance from the easel at which the mask is to be held.

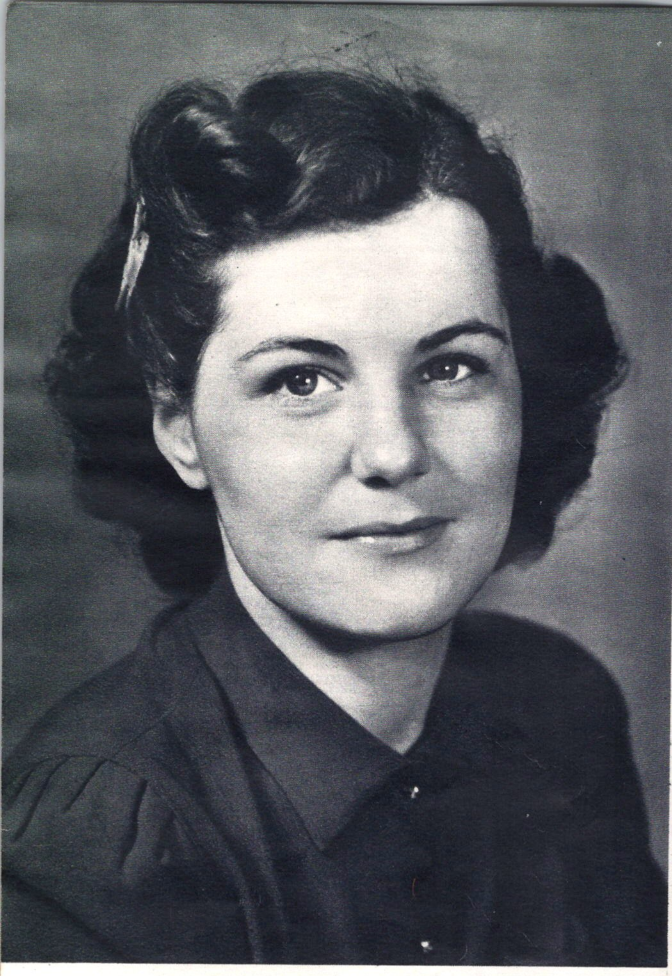
This method of working has a distinct advantage over the others we shall presently discuss, in that it does not require the destruction of the negative nor does it require a copy negative. Before undertaking this procedure, be certain that you have learned the exact exposure for each negative contributing to the montage. If you fail to have these exposures exact the work will be unsatisfactory, since all exposures must be developed together and local control would probably result in a discolored print.

The principal advantage of this method is its comparative simplicity. The principal disadvantage lies in the fact that perfect balance is difficult to secure.

A second way to make photomontages requires that the negatives be cleared of all the images except those portions which are to be used in the finished print. The negatives are then placed together and printed as one.

The first step in employing this system is to prepare your negatives so that the desired portions of the images are located where you want them to be when incorporated into the finished work. This is done either by copying the negative or by having the finished montage in mind when the photograph is taken. Be sure there is plenty of margin around the image to be used. Using a tuft of cotton, apply a reducing agent to the por-

(Continued on page 113)



Miss Mary Zachary, New York model, as she appears without any make-up. (Photos on this and next page by Henry Sill of the Sage Studios, New York City.)

MAKE-UP FOR COLOR IS DIFFERENT

AMID the steady increase of amateur interest in and use of direct color photography, the question of make-up is being given somewhat less than its proper share of attention by many people. In the field of color portraiture, where so often you go to considerable effort and expense to achieve good results, some understanding of make-up is especially necessary.

Make-up for direct color is decidedly different from panchromatic make-up for black-and-white photography. Panchromatic emulsion registers all colors in a carefully graded monochrome from white to black. Make-up for this type of emulsion must be neutral in color so as to register in halftones in the monochromatic scale. Therefore, panchromatic make-up colors are brown in tone.

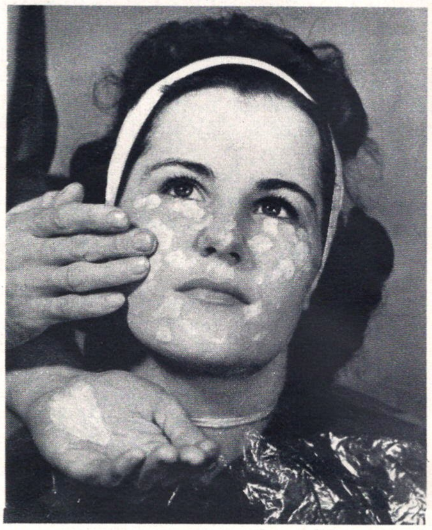
Color photography reproduces all of the colors of the spectrum in their polychromatic values and requires a visual make-up which, through all the intricate manipulations of processing, will show up in the finished photograph as an accurate reproduction of both the coloring and the texture of the human skin.

Every photographer appreciates the utter impossibility of retouching color transparencies. Photographic processes may show marked improvement, but they will never eliminate the photographic qualities of freckles, moles, pigment variations, and blemishes on the skin or near the surface of it. If anything, they will intensify their photographic properties. A man's beard—even when closely shaved—shows in the color positive as a dirty, blue-gray smudge across the lower part of his face, particularly with the new emulsions of the natural color films. The latter emphasize the beard and record it on the film most unflatteringly. Make-up is the only solution to the problem. When make-up with sufficient body to cover and block out these pigment variations and blemishes is used, retouching is unnecessary, and the result is a smooth, even skin tone.

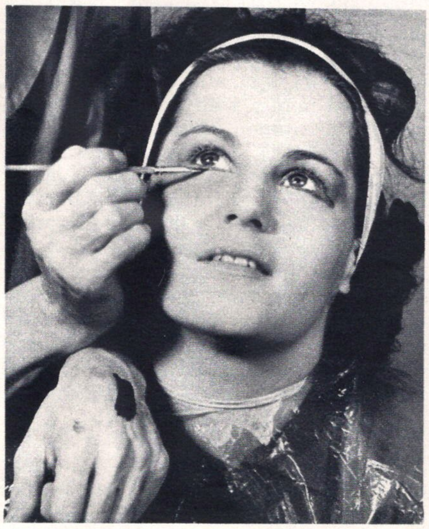
The purpose of make-up for direct color is to eliminate retouching and to give the skin a warm, healthy tone, causing it to photograph naturally and flatteringly, adding to the photogenic possibilities of the subject.

The first thought is that make-up for color photography must duplicate the actual coloring of the human skin, and that somewhere among existing street make-up materials one should find the answer. Unfortunately, tests have proven that street make-up materials are not satisfactory for this purpose. The colors and body of street make-up are not designed to withstand strong photographic lights and the penetrating eye of the camera; the body of the make-up is too transparent, the colors are too anemic. "Street" foundations and powders are of little value; but the rouges, mascara, and eyebrow pencils will be found satisfactory.

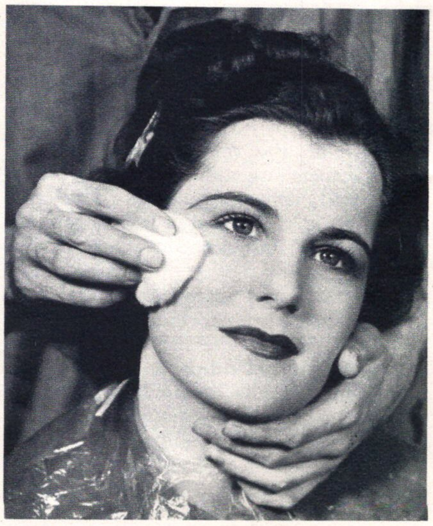
The best and most natural photographic results will be obtained by combining stage, camera, and street make-up materials and technique. The stage and



The foundation is stippled over the face. Note the make-up cape worn by the model.



The eyes are defined with a soft, thin brush, after eyeshadow has been applied.



When the make-up has been powdered, dry rouge may be blended into the foundation.

IT'S a big jump, and an important one, from regular make-up technique to the use of cosmetics in color portraiture. Here's the way a noted expert handles the process.

By WRAY MELTMAR

Nationally-known make-up consultant; Author of "Photographic Make-Up"

Fully made up by the author for a color shot, Miss Zachary photographs like this. Compare this picture with that in the upper corner of the preceding page.

panchromatic materials are more satisfactory because they are sufficiently opaque to block out all skin blemishes. Their colors are stronger and more vital, and are designed to withstand the strong lighting necessary to photograph in color. They do not fade or wash out under the lights.

Most of the color photographic processes are oversensitive to certain colors and undersensitive to others. Particularly is this true of the natural color films. Make-up is the only means of compensating for this over- or undersensitivity, insofar as the skin tone and natural coloring are concerned.

Both the new Kodachrome and Dufaycolor films are weakest in the recording of yellow, being more sensitive to green and slightly oversensitive to red. This is especially true with regard to flesh tones. Flesh without make-up, with ordinary street make-up, or with make-up not designed to compensate for this oversensitivity, has a tendency to go too red (particularly in the shadows), resulting in a "boiled lobster" flesh tone. If this is corrected in processing, the other colors in the picture suffer. Therefore the photographer must compensate for the oversensitivity to red by building up the yellow and blue end of the spectrum with make-up. This is done by using a yellowish or yellow-tan make-up with little or no red in its composition, and a red-orange shade of rouge.

Because color photography and its required make-up are still in the experimental stage, and because each person to be photographed presents an individual problem, no one can give a standard prescription for color make-up. The only materials available are those used in stage work, and a few of the panchromatic variety. These are easier obtained (and more widely used in "still" color photography) than the Technicolor materials used in motion pictures. Listed at the end of this article are the most useful items among the lines of make-up on the market.

In addition to a selection from these lists, powder puffs, cleansing tissues, absorbent cotton, an eyebrow brush, olive oil, brilliantine, and towels will be needed in the make-up kit. Elizabeth Arden does not make liquid body make-up to match her stage materials. Because Helena Rubenstein's foundation is a liquid powder, no body make-up is required.

Anyone of the lists shown completely covers the photographer's make-up needs and will produce all of the skin tones from very light cream to dark suntan for both sexes. The lists may be reduced to meet the requirements of the individual, as desired.

The most satisfactory results are obtained by using a darker foundation than the person's skin tone and a lighter, or neutral, powder over it. Few of the foundation colors listed can be used just as they come from the tubes. The "Cream," "Ivory," and "Rachel" shades are too light and yellow. They are *blending* colors, for mixing with other colors to lighten them and give them a slightly yellow cast. "Flesh," "Juvenile," "Pink," and "Orange" are too red. They are used to warm other foundations by blending. "Peach," and Nos. 22 and 2 may be used straight with a neutral powder on light blonde and white-haired women. "Brunette," "Olive," "Suntan," "Spanish," and Nos. 26 and 7 may be used straight, with a light powder, on dark-skinned women and men. These shades are also used to darken other colors.

The foundation colors are easily blended on the palm of the hand. Squeeze out a small amount from each tube of the colors to be used, and blend the different shades with the finger until the desired tone is achieved and blended evenly. As an example of blending, the foundation used for the make-up on the young woman whose portrait graces the cover of this magazine included the following: Stein's Foundation No. 23 (Brunet)—½, No. 21 (Peach)—¼, and No. 5 (Ivory Yellow)—¼, with Max Factor's Powder No. 8 over it. The cheek and lip rouge was Helena Rubenstein's Red Geranium; the eyeshadow was Max Factor's No. 22 (Dark Brown).

Brown eyebrow pencil was used under the eyes, black and brown pencil (blended and applied as directed below) for the brows, and brown mascara on the eyelashes. Miner's Brunette Liquid Make-up was used on the neck, arms, and hands.

A little time spent in experimenting with blending colors will teach the photographer much of value and thereby will pay dividends. You will soon find that you can produce any skin tone with your make-up colors; minor shadings become easy to effect.

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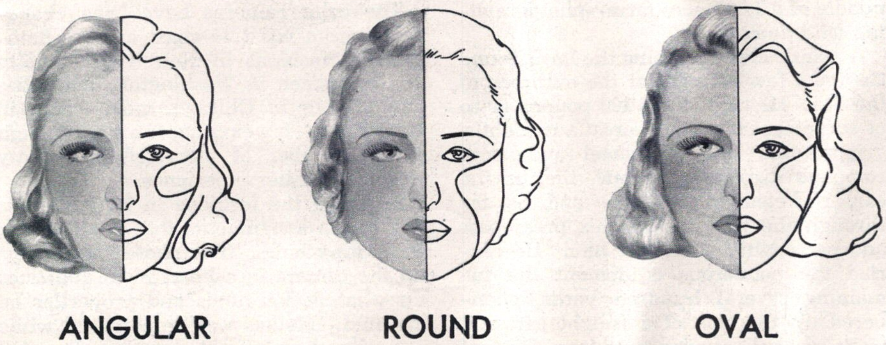
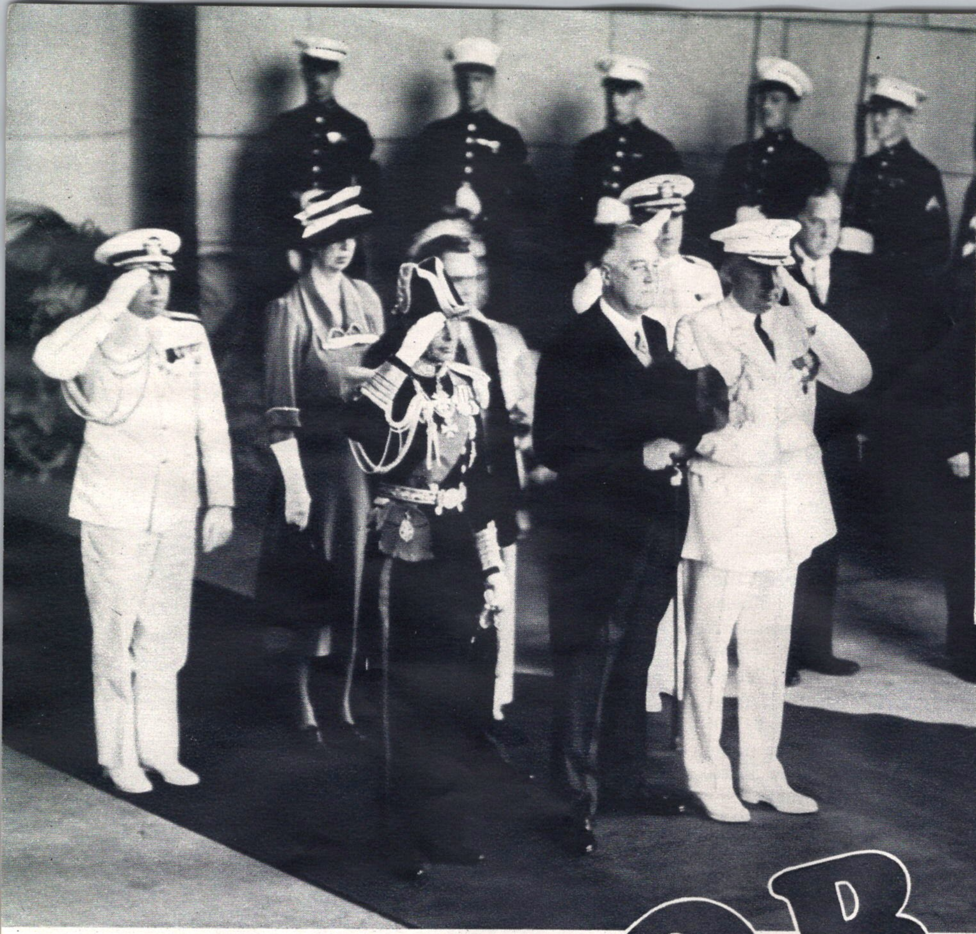
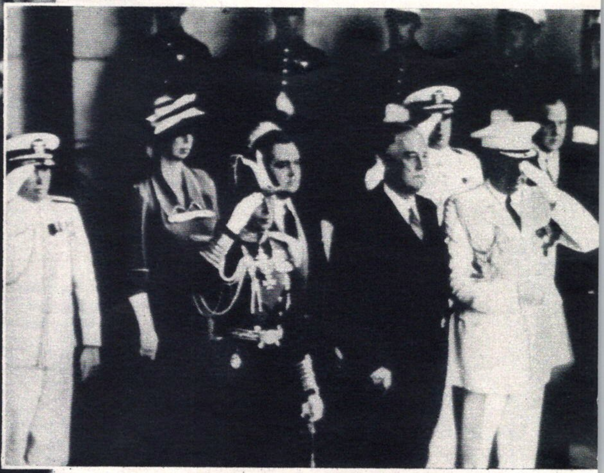


How rouge patterns can correct facial contours in color portraiture is shown in these drawings by Donald DeWoody. Rouge is used to eradicate, not to build. (See Text.)





History was made in more than one way when President Roosevelt met Their Britannic Majesties in Washington this year. The Tribune crew covered the event and rushed color separations to Chicago by Wirephoto, catching a regular edition of the paper. At the left is the scene as originally photographed. Above: A positive from the red printer in the set of color separations which were sent by wire.

COLOR MEETS THE DEADLINE

By EDDIE JOHNSON

Director, Chicago Tribune Color Studio

When the Chicago Tribune ran a full-color fire picture before the fire was out, editors gasped. Here's the way the fast-working color crew gets such scoops.

WE had been sitting around the *Tribune* Color Studio for a few days doing routine work and hoping that something really newsy would break. All was quiet. So, since it was Spring, our ace photographer, George Greb, decided to take the color camera and photograph wild flowers on the paper's 1,000-acre experimental farm, 60 miles from Chicago.

While he was there the million dollar grain elevator conflagration on Chicago's South Side began, with conditions being ideal for a color picture. It was the chance of a lifetime to make a news deadline with color. And our photographer had the camera, somewhere in the middle of a 1,000-acre farm—photographing *wild flowers!*

A frantic crew, combing the farm, found George a few hours after the outbreak of the fire. He rushed the 100 pounds or so of equipment into the nearest automobile, gripped the steering wheel and, with complete disregard for law, life, or the car, rocketed to the fire and as far through the fire lines as his press pass and personality could get him. He carried the ponderous equipment the remaining several hundred yards, clambered up the side of a freight car, and made a couple of exposures from the roof of it.

Meanwhile, at the studio, technician Al Gras placed all his darkroom equipment in readiness. This was the time toward which he had been working ever since 1923!

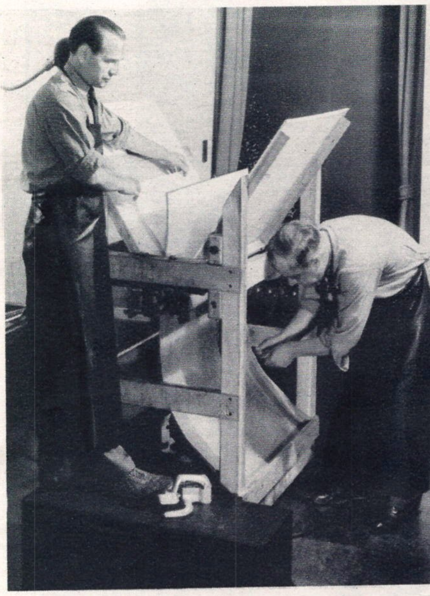
The plates arrived. With quiet efficiency they were developed, fixed, and washed. Prints were made from the wet plates. Every conceivable short-cut was taken. Al Gras had a set of positives in the engraving room in a little less than two hours! The next issue of the *Tribune* ran the picture in color. It made journalistic history. We'd beaten the deadline with a color picture!

Color pictures in time for the day's newspaper had long been the dream of manufacturers of photographic materials, photographers, technicians, and engravers. And they are rapidly improving in quality as we get a firmer grip on them. This is the work of the *Tribune* Color Studio.

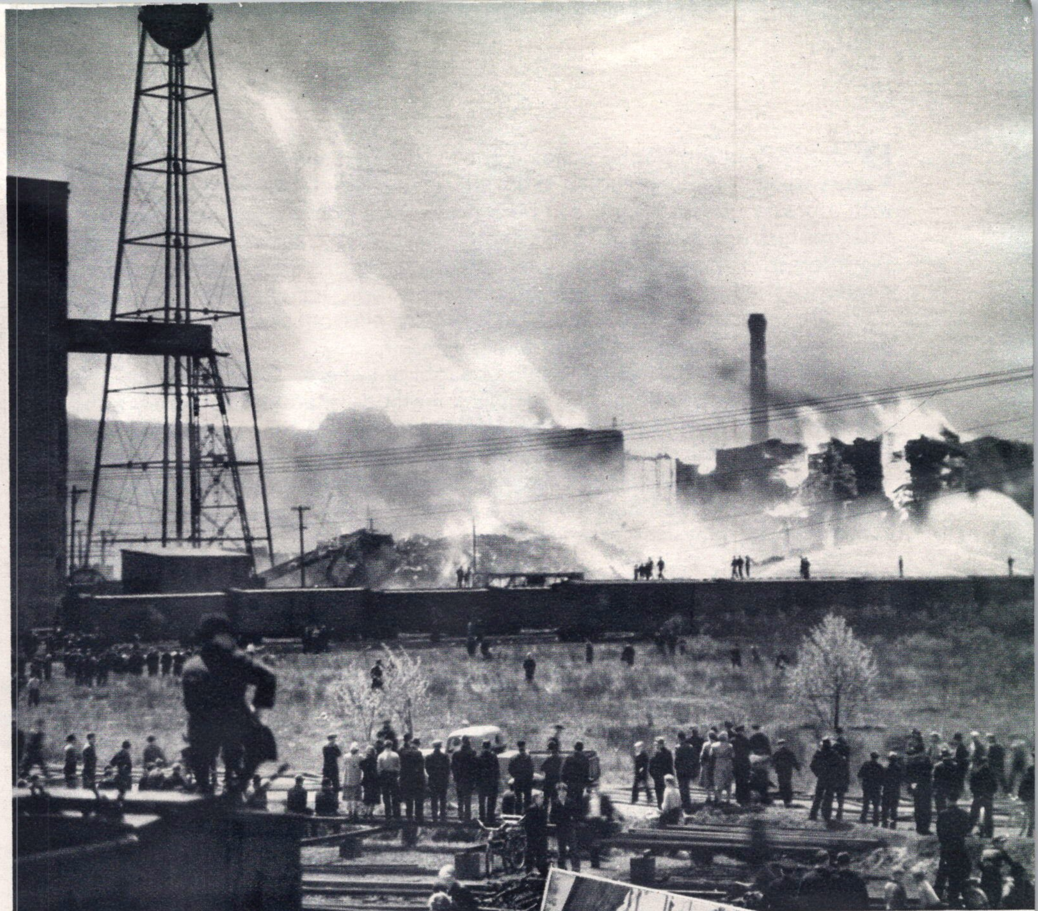
We've taken many spot news pictures with the color camera since the grain elevator fire. Each shows decided advancement over its predecessors. We've even sent color pictures by Wirephoto in an effort to find the weaknesses in color news photography so that we may wipe them out.

The color cameras have been chaperoned from coast to coast as we photographed fashions in New York, royalty and statesmen in Washington, celebrities and studies in Chicago, movie stars in Hollywood. It's exciting fun even though every member of our staff is slightly grayer from the experience.

Scooping the fashions in New York is one of the assignments that accounts for those gray hairs. The photographer sets up the camera in a hotel room and lines up what backgrounds and properties he can find. Models wait impatiently while one of us hurries a dozen or so Parisian imports through the customs. George takes the pictures and rushes the plates



Al Gras (left) and the author working at the squeegee machine. Gras was making color prints in his own kitchen as early as 1923, and knows Carbro technique as few others do.



When the big grain elevator fire started in Chicago, George Greb and his color camera were 60 miles away, photographing wildflowers. But Greb rushed into town and got this shot from the roof of a freight car near the scene. The picture ran in full color, beating the deadline.

back to Chicago. And the *Tribune* runs the photographs in color before elegant fashion magazines can show the same costumes photographed in black-and-white several days earlier in Europe.

King George and Queen Elizabeth of England were in a dimly-lit station in Washington the only time we had a good chance to take their picture. Our Bermpohl camera was mounted on a high platform and everything was in readiness, but the Weston reading was 20, and that called for a *full second* exposure. Our photographer stood there patiently waiting. His opportunity finally came when the band played "God Save the King!"

We covered almost every important movie lot in Hollywood, photographing most of the leading stars and irking busy people no end. We were never more delighted with our newspaper training for fast work than when photographing Spencer Tracy. He was particularly busy when we took his picture and could only allow us 5 minutes. A secretary sat nearby with a stop-watch while we worked. We finished one exposure. The watch ticked mercilessly. We finished our second, in a total elapsed time of 4 minutes and 32 seconds!

Merle Oberon was at work on a picture. Despite the pleading of her press agent (press agents are always on our side), the director said she didn't have time to pose for us. Awaiting an opportune moment, we shanghaied her (not against her will) to a corner of the set where she changed costumes behind a board. We had just finished taking her picture when the director discovered her absence, too late to do anything about it.

After our return home we settled down to the usual routine of calm chaos. As each visiting celebrity or star comes to the city I dash out to the airport or station with the good old glad hand and beg, bully, or bargain with the personage to come up to the color studio. I phone in about the color of the clothes the subject is wearing, so that the background won't clash. Usually we have just a few minutes before our victim has to catch a train or attend some luncheon or other.

For example, Gary Cooper came to town. He thought he was on vacation until the mob attacked. He arrived at 2 p.m. and was scheduled to leave at 4:45. The gang at the studio waited. And waited. *And* waited. But Mr. Cooper didn't show up. The crowd had him cornered at his hotel. We dismantled our meticulous studio preparations for the picture and loaded them into a cab. In a hotel room we erected our set and took the picture. It was all in a day's work.

A house beautifully illuminated by Christmas tree lighting looked like it would make a swell picture. But by the time the camera was moved back far enough to include the entire building we found the lighting was so dim that it was impossible to take a reading. The photographer took a long-shot guess and exposed the film for half an hour that chilly winter night. The fates were with us. That picture is one of the prize possessions of the studio!

We are reasonably consistent in turning out attractive color prints now, despite the fact that our studio probably takes more pictures with a pellicle-mirrored camera than the rest of the color studios in the country combined. It's a far cry from those days when color was young

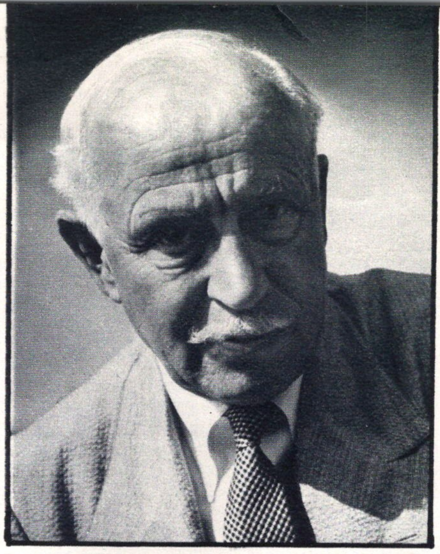
(*Continued on page* 90)

Above: Greb and Johnson take a one-shot color photo of Shirley Temple in Hollywood. Below: Rushing a fashion shot in a New York hotel room, in order to make a scoop. This crew's work is strenuous!

PORTRAIT photography is not a trick. It is not even a science. It is a mystery which is really Freudian in its nature; unpredictable, inexplicable. Anyone, with a pretty good camera, can be a pretty bad portraitist—and usually is. The true masters are as rare as hen's teeth. And why? Because, wholly aside from the interest, or beauty of the living subject; aside from any merit in the lighting, any suggestion of rhythm, feeling for composition, handling of graded shadows; aside from all these, there must be a wholly plus quality, a magical something deriving solely from the photographer himself.

Cameras, like Tom Webb's, can be bought anywhere. Concerning his films, too, his darkroom, his developer, his technical methods, there is no mystery at all. The enigma, all of it, springs from Tom Webb himself: his sensitiveness as a man, his ability to apprehend, and evoke, spirit; to imbue his masculine sitters with an added and perhaps unsuspected aura; in short, to mirror a man's inner life, rather than the transitory and superficial aspects of his physical exterior.

Frank Crowninshield



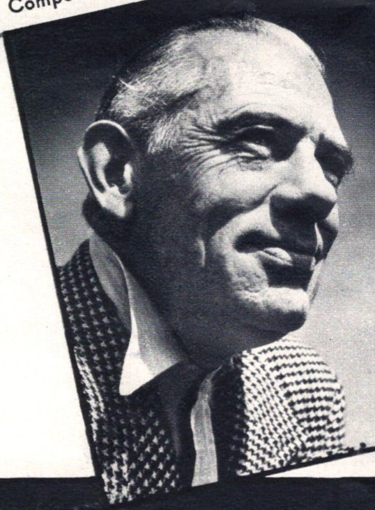
Frank Crowninshield
Editor, Condé Nast Publications

SNAP MEN AS THEY ARE

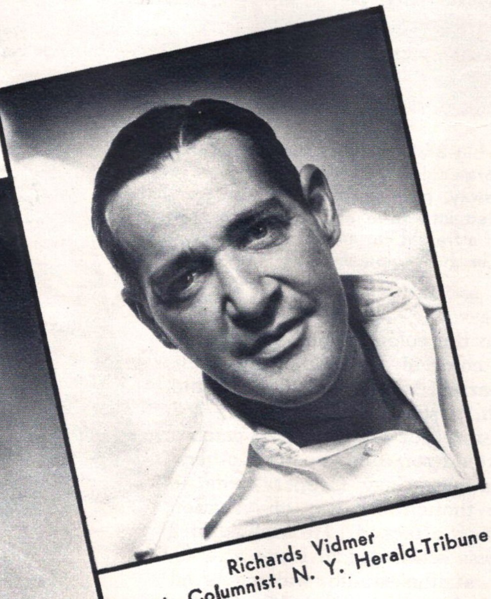
BY

TOM WEBB

Painter and Illustrator



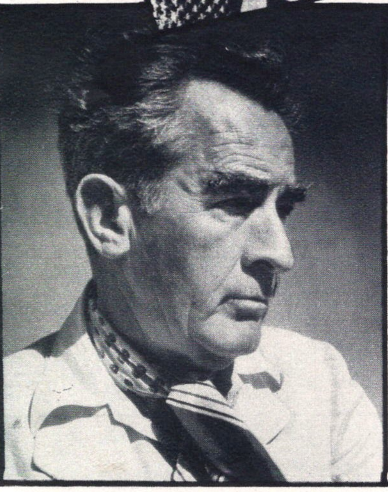
Gene Buck, Pres., American Society of Composers, Authors, and Publishers



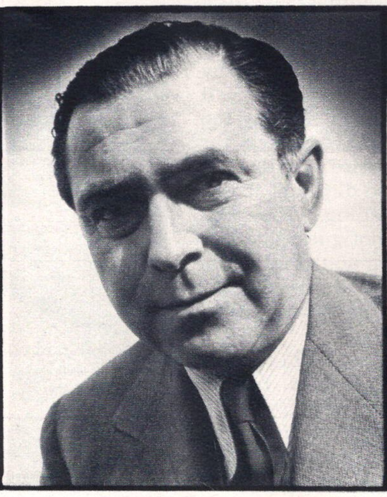
Richards Vidmer
Sports Columnist, N. Y. Herald-Tribune

AT some time or other you have probably felt the urge to go to Africa and hunt big game. Books by the score have related the exciting adventures on safaris into the jungle, tiger hunts in India and Indo-China, long treks into the Himalayan wastes, and all after some rare species of game. These tales stir our blood and quicken our imagination.

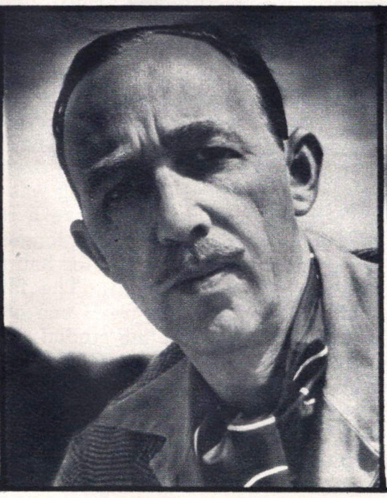
However, the thrill that quickens my pulse as no animal chase would, is the photographic "man hunt." Of course this is not an affair with gun, beaters, traps, and bloodhounds. It probably sounds silly at first. Yet, you've seen people wait for hours, in any kind of weather, to get a glimpse of royalty or a passing President. Think of the thrill of getting some intimate shots of King George and Queen Elizabeth while they



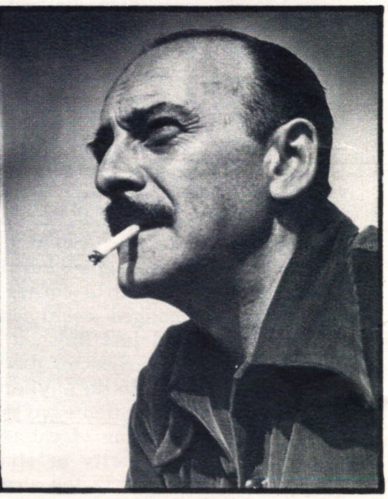
James Montgomery Flagg
Illustrator



Steve Hannagan
Publicity Man



Sid L. Hydeman
Art Director, "Redbook" Magazine



John LaGatta
Illustrator

were here. But it would be a tough job to capture their Majesties; also a tough job to photograph a President.

It's the same with any man of great importance. Could you photograph a tycoon in his business office, a dramatist lost in the details of a new play, a composer writing a song, or an artist in his studio? This, as an example, can not usually be done. The subject will appear better if he is away from all this where he can *really* be himself. I mean far away from his daily routine, and, if possible, out in the open.

The Artists and Writers Golf Club have a yearly tournament in Palm Beach in the month of February. This has usually been the spot for my "man hunt." America's most famous men of Arts and Letters gather here for fun and relaxation. So, into my golf bag I slipped my little camera all loaded and ready for action and surprises.

It was no easy job to shoot them even in their Palm Beach lairs. I recall Gene Buck (not "Bring-'em-back-alive" Buck, but Gene), the man who knows everybody, and the man whom everyone finds it a pleasure to know. After an eighteen-hole struggle over the golf course in tournament play, Gene was dog tired, his resistance worn down to practically nothing. It was then that I saw my opportunity to drag out the little camera with its searching eye. Gene sat right down on the fairway and I "bagged" him.

Then there was "Bud" Kelland; you know, the famous Clarence Budington Kelland whose stories are constantly popping up in magazines, books, and on the screen. Here was another rare specimen to shoot. After about two years of nearly capturing him, I finally caught up with him on the golf course at the North Hempstead Country Club. Despite his great fame and his ability to talk and write he is as shy of cameras as a quail is of a dog. Getting him to face that inquisitive tunnel of glass was quite a job. I was so doggone excited that I couldn't remember afterwards whether I shot him timed, stopped, or filtered. All I knew was that I had a camera pointed at him and that I hoped I had *something* on the film in return for my efforts.

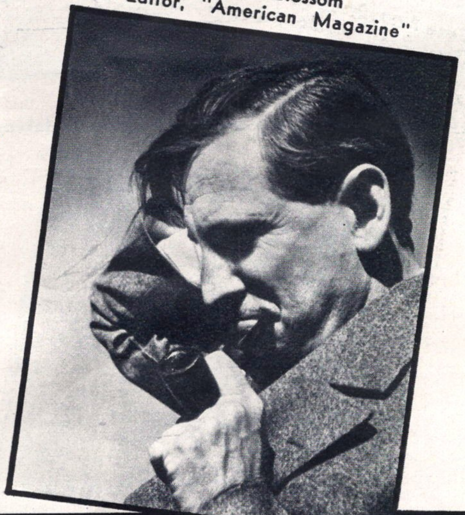
Tom Webb . . . painter and illustrator by occupation . . . cameraman by avocation. His superb he-man portraits of celebrities won him an enviable reputation as a photographer.

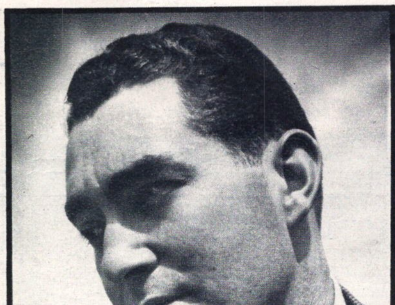
"Granny," or Grantland Rice (he of the sports fame), was another tough man to get. It seemed that no matter where we went—Florida, Cuba, Bermuda, or the metropolitan golf clubs in and around New York—Granny was as elusive as a ray of light. Even when we *did* meet in a spot possible for a picture something always intervened to stop our proceedings. However, one day when I least expected it, I saw him plodding up the fairway approaching for a birdie. After putting out he sat down on the side of the green for a rest. This was my chance, and, with anxious fingers, I shot him quickly and painlessly. In my little camera rested a picture of a man whose name stands for unbiased sports news. A fine, generous, and understanding human being. Can you imagine anyone trying to *pretty up* such a man?

It was the same way with Frank

(*Continued on page* 84)

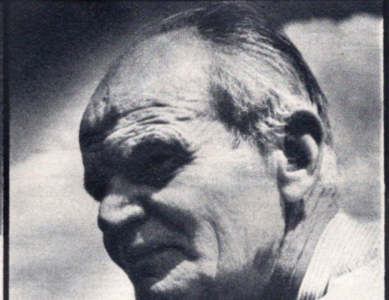
Sumner Blossom
Editor, "American Magazine"





Al Lefcourte
Art Editor, "American Magazine"

Thomas Bull
Artist and Designer



Clarence Budington Kelland
Noted Author

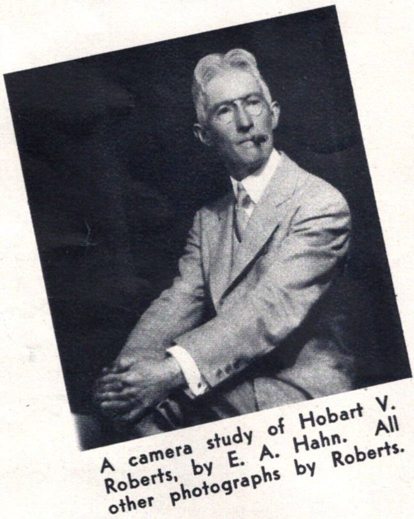
Grantland Rice
Sports Editor and Publisher

HUNTING WITH FLASHPOWDER

BY BOB SALTER

HOBART ROBERTS HAS BEEN MAKING PHOTOGRAPHS OF WILD LIFE FOR OVER 30 YEARS, WITH OUTSTANDING RESULTS. THE SUCCESSFUL METHODS HE EMPLOYS ARE DESCRIBED HERE.

One of Roberts' most famous shots, this excellent picture of the leap of a startled deer at night has taken honors here and abroad.



A camera study of Hobart V. Roberts, by E. A. Hahn. All other photographs by Roberts.

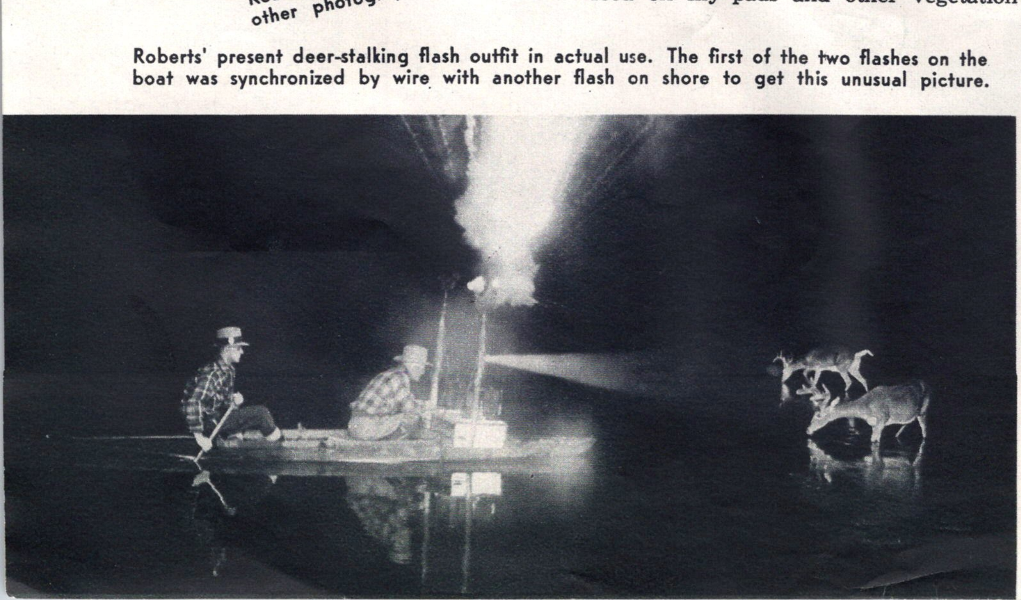
ARMED originally with basic equipment which many photographers would call primitive, Hobart V. Roberts for many years has been getting outstanding pictures of wild life in the Adirondack lake region of New York state.

His secret for success is a thorough knowledge of the ways of his subjects, coupled with resourcefulness in using his camera and its accessories. Pictures of deer predominate among Roberts' work, which has received world-wide recognition among sportsmen and photographers alike.

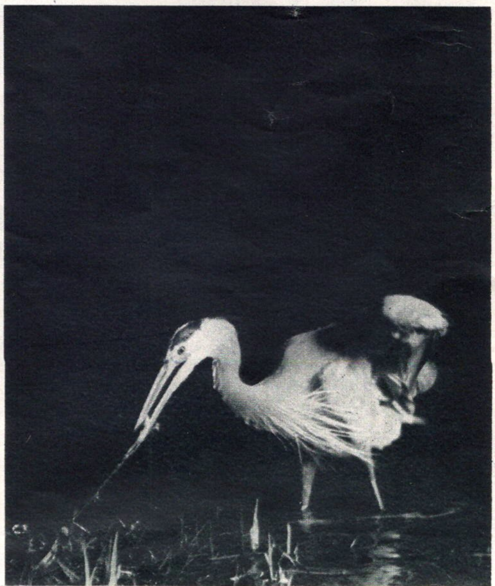
The deer are found in shallow water where small streams empty into the lakes. They come to these spots at night to feed on lily-pads and other vegetation which abounds in such places. The biggest problem in photographing them is to approach within a reasonably close focusing distance without disturbing them.

Roberts' original photographic equipment for this work was quite simple. He installed a small lantern in the bow of a small boat. The light source was either a kerosene flame or a candle, with a metal reflector behind it. In back of the light was a 4A Kodak set on a tripod. The lens was stopped down to *f* 11 or *f* 16, the shutter was opened at the start of each nocturnal trip and left open until the first flash exposure had been made,

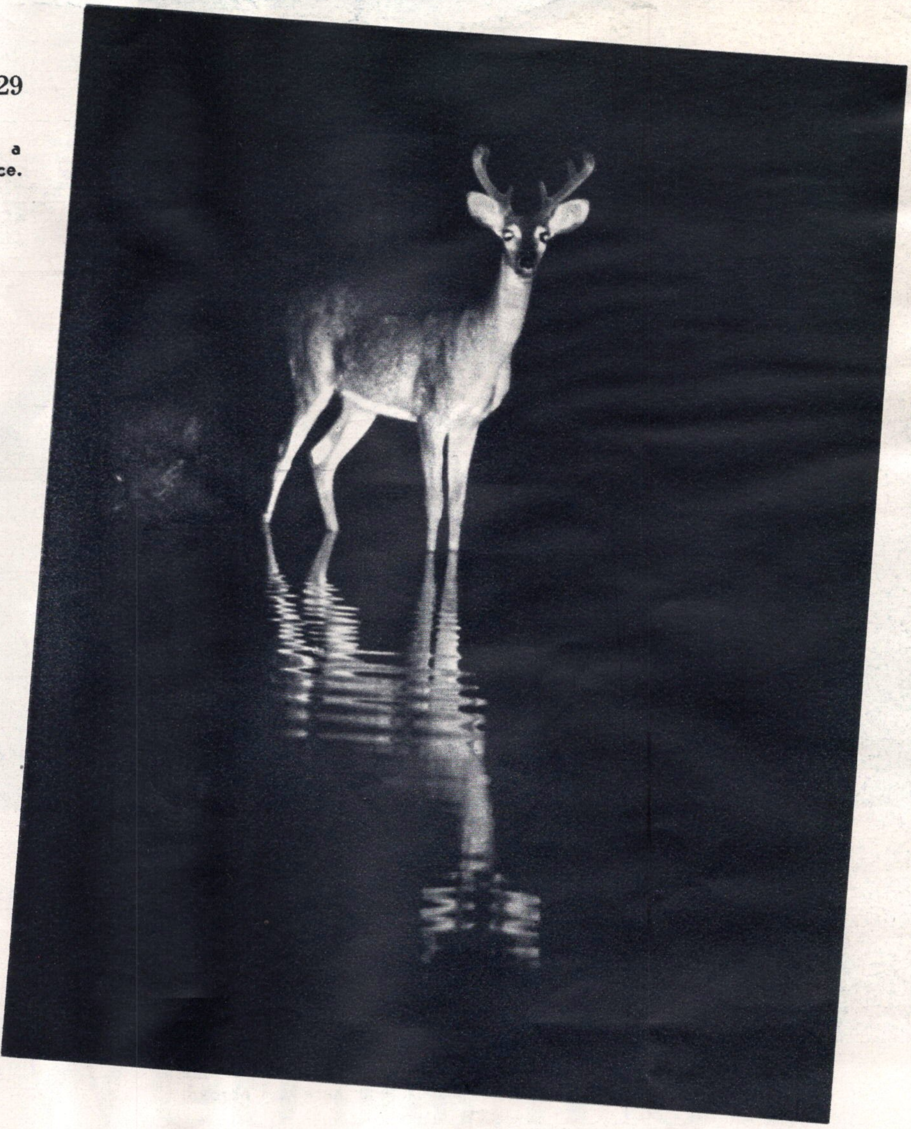
Roberts' present deer-stalking flash outfit in actual use. The first of the two flashes on the boat was synchronized by wire with another flash on shore to get this unusual picture.



"Self-portrait" of a Great Blue Heron, whose tug on the bait took the picture.



Titled "In the Stillness of the Night," this shot took a silver medal in 1915, has appeared in many salons since.



and the camera was prefocused at 25 feet.

One-third to one-half of a ½-ounce bottle of flashpowder was spread in a tray fastened to an upright stick, the powder being above the camera and to one side of it. The charge was fired by pulling a chain attached to a spring which set off the priming cap.

When the deer was discovered, by means of its faint outline or the reflections from its eyes in the dim lantern glow, the boat was moved toward it, *silently;* when the camera was within 25 feet the powder was fired. The open shutter permitted the entire duration of the flash to register, the picture was taken, and the startled deer bolted for the woods.

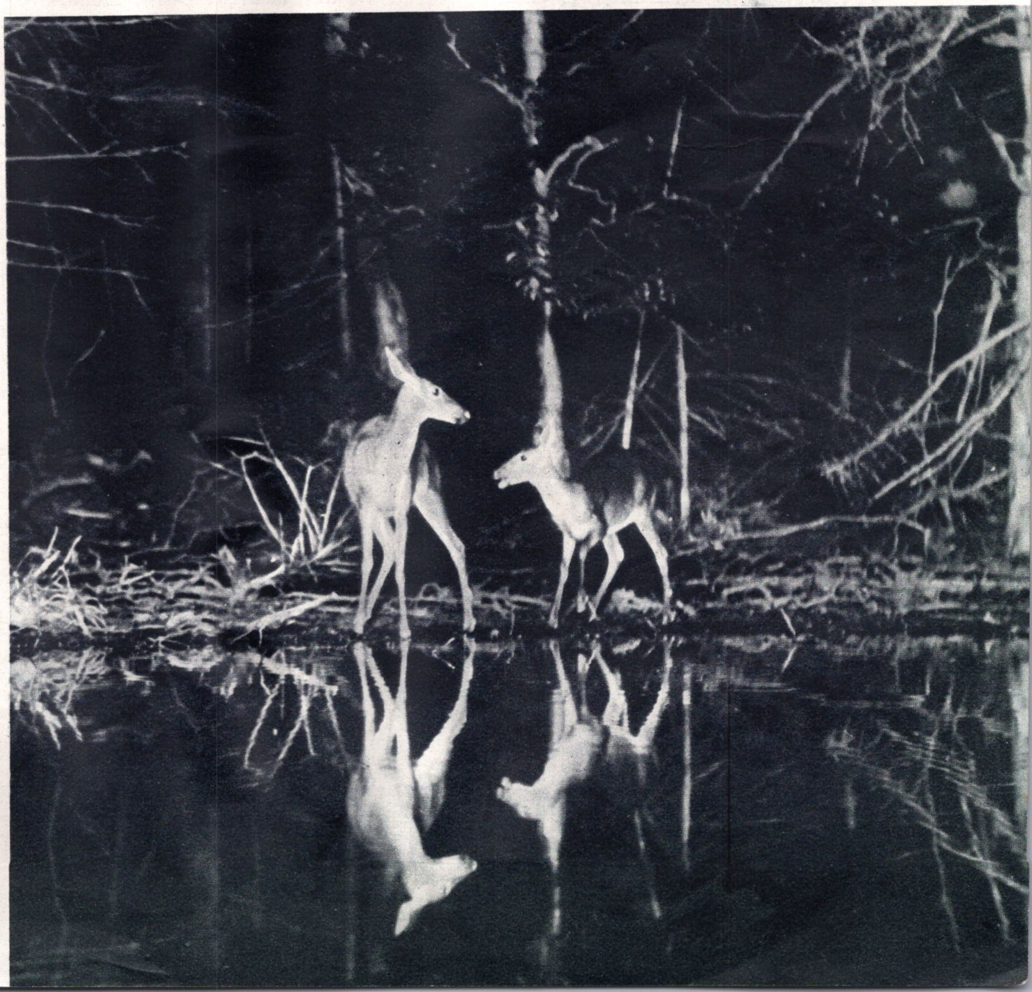
A great many still pictures were made in this way, but as the deer symbolizes fleetness the desire to record the unseen action immediately following the flash became so strong that various means of getting such pictures were tried. Roberts' present system and equipment were developed through years of experience, and it is felt that some description thereof may interest the readers of POPULAR PHOTOGRAPHY.

A low platform is constructed in the bow of a duck boat. Two 5 x 7 cameras are fastened side by side to this platform. Each camera is covered with a canvas hood having a small hole through which the lens shade projects. The diaphragms are wide open (ƒ 3.5 and ƒ 4.5, respectively), one shutter being set at 1/300, the other at 1/200 second. Both cameras are prefocused in daylight at 25 feet and fastened *securely* to the platform. Both are sighted dead ahead, in line with the light. The type of light Roberts now uses on the front of the boat is electric; using a 4½-volt lamp which is wired through a rheostat to a three-cell battery. It is not a spot, being more of a soft wide-angle floodlight. It is fastened about half way up one of the two flashlight standards.

Separate flash equipment is arranged for each camera, both outfits being identical but independent of each other. Before starting out, Mr. Roberts places

(*Continued on page* 127)

A fawn and its mother, startled by the sudden flash. By photographing deer across water, Roberts obtains reflections such as are seen here. They add much to the pictorial quality.



This daylight shot of a loon on the nest was obtained through stealth and patience.

Dick Verigan of Rollins College took advantage of Florida's beauty for this shot.

PHOTOGRAPHY In CAP and GOWN

by EMMA H. LITTLE

Picture Editor in the Sunday Department,
New York Times

Universities, colleges, and schools are fast incorporating photographic courses in their curricula. The author gives a newsy survey.

PHOTOGRAPHY has entered the halls of higher education and is now in the cap and gown stage along with the classics and science. Scholastic recognition is filtering downward through the intellectual strata and has reached camera-conscious youngsters in prep schools and in Junior and Senior High.

I used to think that photography was photography, but apparently I was naive. In all the college curricula I studied, I found photography listed as a course subordinated to some particular department. It is variously grouped under Physics, Optics, Mechanic Arts, and Art. Regardless of cataloging, the courses offered have fundamental likenesses and aim at the taking of good pictures, so there is no use in quarreling with classifications. The main lines of divergence in the varied groupings recognize photography either as an aid to practical living or as a contribution to the esthetic side of life.

Bennington College for girls, in the hills of Vermont, and Rollins College (coed.) basking in Florida sunshine, offer two contrasting schools of thought which are interesting. Bennington classes, ranging usually from twelve to fifteen in number, are under the direction of Edward Avery Clark who organized the course five years ago. There photography is considered a technique and part of the equipment of modern living. Hence it is offered as a "tool" course, not detachable from the processes of living, although it is under the Art Department. Science students specialize in microphotography and photomicrography, while girls who major in economics and sociology, develop documentary news and other related types of camera studies.

Projects determined upon in class are often worked out by groups of three or four. Many of these are field projects developed during the periods of study the students spend away from college. They go to various centers to study social conditions first hand, sometimes to a social settlement, a community of industrial interests, or to follow up some phase of health or medical study. For instance, last year a student spent her leave in a

Advanced students at New York University get practical instruction in the use of enlarging equipment.

This unusual picture entitled "Bum's Ease," was taken in Paris by a student of Bennington College for girls while engaged in nonresident work.

"Generatrix," prize winning picture by 15-year-old Eugene Lesser of New York.

photographic laboratory in a Philadelphia hospital.

Fertile fields for photography abound throughout the year in the colorful life at Bennington, and the numerous illustrations in the college publications are mostly student work. The college maintains a remarkably complete file of photographs that covers sports, folk and modern dancing, parties, and classroom activities. One noteworthy assignment given the photographic classes is making records of entering freshmen. Each Bennington graduate can leave college with a pictorial record of her four years there.

The equipment at Bennington includes a double darkroom, one part for developing and the other for printing, as well as a studio with lighting equipment for portraiture and still life. The college owns a Graflex and a view camera. These are supplemented with three enlargers — an Elwood, a Zeiss, and an Omega. Students are urged to own their own cameras and many do, although those owned by the college give opportunity to learn the use of a variety of models. Bennington supplies all chemicals, while students furnish their own films and paper.

The Rollins approach is different. The strong Art Department has an extensive program for developing aptitudes of talented students in painting and sculpture. The college recognizes that there are many students with artistic yearnings in their souls who lack artistic ability. Photography gives them an outlet.

The course, directed by John Tiedtke, gives this group a chance to participate in creative work. With this sympathetic idea as background, the study of photography is designed primarily for amateurs who want to become competent in handling a camera and an enlarger, and in knowing what makes a print good or bad. The first weeks are given over to the mechanics of the course, the developing of negatives, the making of enlargements, and the preparation of chemicals used in developing and printing.

After these preliminaries the real work begins. Working in small groups, the students set up their cameras with the subject focused on the groundglass. Mr. Tiedtke then goes the rounds, making suggestions about framing which is, more often than not, bad; confusion of detail, distance and perspective, relative space for sky and landscape, light and speed. He has found that these direct criticisms accomplish results much more effectively than the criticism of a mass of finished prints made by the trial and error system.

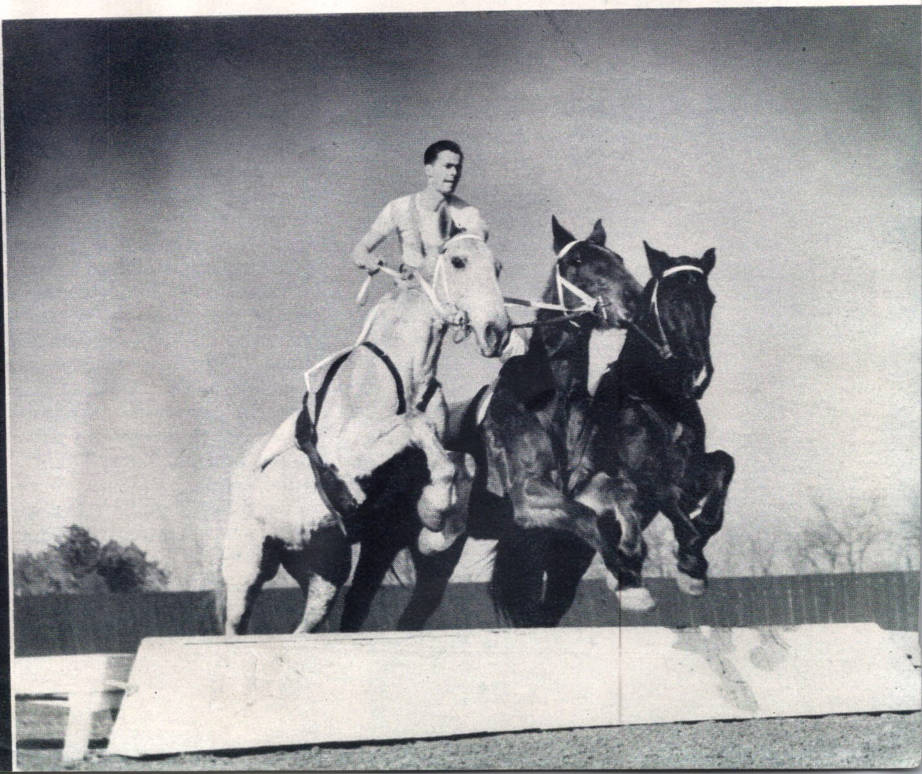
Intensive training in seeing a composition soon materializes in the picture the student meant to take from the start. The class progresses quickly in the ability to see their own defects and to correct them before exposing the film.

The creative side of photography is stressed, once these fundamentals are acquired. Each student is urged to seek out some type of subject that most appeals to him. Often when he is confronted with a choice, he hasn't the slightest preference. Once his powers of observation have been sharpened, he finds something and his pictures evolve, rapidly, from mediocre to excellent. He has finally learned that photography is true self-expression, the aim of the course.

The Rollins course covers three years and is limited to fifteen students who are

(Continued on page 94)

"Candlelight," by Anthony Ficalora, sixteen, of Brooklyn, won Second Prize in the Second Scholastic Salon.



This striking action shot by Forest J. Sorenson of Iowa State College is representative of the fine work that is being done in college classes and clubs.

Outdoor scenes that radiate naturalness are a specialty with Toni Frissell. Above are two sparkling examples of her work. The bathing girls were shot for Condé Nast. Toni Frissell is shown in the insert.

Toni Frissell— OUTDOOR SPECIALIST

By MICHAEL TALBOTT

EIGHT years ago Toni Frissell set about the difficult task of carving a name for herself in the annals of photography. Long before these eight years had passed her name was a byword for good pictures. Frissell pictures were adorning the pages of *Vogue*. Frissell pictures were winning high honors in national and international salons.

When I was interviewing her in the office of her agent, the phone was ringing constantly. Publishers wanted her to do a book. Department stores wanted to exhibit her work. Dowagers wanted sittings for portraits. Anxious mammas wanted her to go straight down to Southampton and photograph their little dears on the beach.

Two things dominate her work—people and the out-of-doors. Freedom and grace of movement in the open fascinate her. "I like to take photographs of people in action—doing the things they love to do—swimming, riding, playing tennis or golf, skiing, skating, hunting, fishing," she said.

"Landscapes as landscapes leave me cold. They don't become alive until people get in them. I hate to photograph glamour girls. I like a woman to be beautiful one moment, ugly the next. I love to photograph human beings in outdoor settings. I am not at all interested in the pores of somebody's skin or the tonsils of a hippopotamus."

What this tall, distinguished camerawoman strives for are beauty and naturalness.

"I never use anything but a miniature camera. I never retouch," Toni Frissell explained. "I have been using color film for about two years and like it when it is necessary to show the texture of fabrics

At home Miss Frissell is Mrs. Francis Bacon III. These youngsters are her children.

The tragedy and dignity of a race is mirrored in this dramatic photograph of an Indian taken by Miss Frissell near Santa Fe, New Mexico. A yellow filter darkened the sky to set off the subject.

An unusual fashion shot made for "Vogue." Pictures that show fine texture such as this are exemplary of Toni Frissell's work.

PEOPLE, the freedom of nature, and texture are the subjects on which Toni Frissell concentrates in her work. The famous woman photographer tells you about her idea of good pictures and her technique.

Made for Condé Nast, this picture is outstanding because of the brilliant detail and the complete lack of a posed effect.

for fashion work. But I prefer black-and-white for portraits. I think that color has much to accomplish before it can supersede black-and-white.

"I have been a photographer for such a short time I feel it would be pompous for me to give any advice to the amateur. The only tangible thing I can say is that I never allow my subjects to look at the camera. It makes the picture seem posed."

She will travel any distance to get a natural print: Palm Beach; Charleston, South Carolina; the Riviera; Hollywood; the Austrian Alps; Sun Valley, Idaho—anywhere for naturalness.

Because Miss Frissell is exceedingly modest about her own accomplishments, I picked out five or six of her outstanding photographs and asked her to tell just how she made them. One of the most famous is the girl with the surf board, done for the Condé Nast Publishing Company. Note the swirling beauty of the water, the live look of the spray, the poised figure, the way the glint of the sun brings out the texture of the foam.

"This was just a lucky shot," Toni Frissell explained. "I had a Contax with an ƒ 1.5 lens and took ten or twelve pictures. The exposure on this one was 1/100 second at ƒ 6.3. I didn't use a filter. Everything just happened to hit right.

"The print of the Indian, standing on his ruined empire, was taken in New Mexico, near Sante Fe. I love photographing Indians. I feel somehow the tragedy and the dignity of the whole race in this picture. I used a Super Ikonta B and a light yellow filter. The sky is so very brilliant in New Mexico. The aperture was ƒ 11, the exposure 1/50 second.

"I enjoy doing pictures which show texture, as, for instance, the girl sitting

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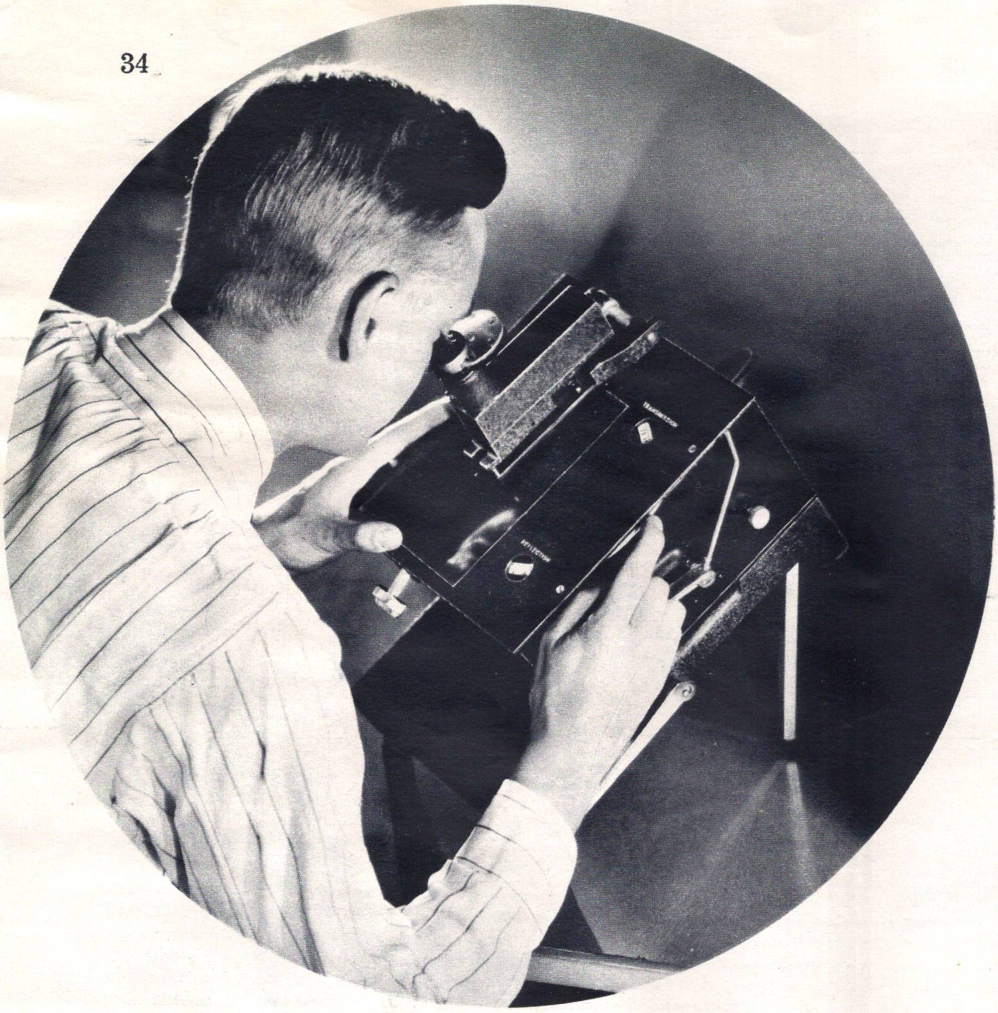

Fig. 1. The Eastman Transmission and Reflection Densitometer in use. Standardized film development and a constant light source enable this instrument to measure negative densities.

How Fast IS YOUR FILM?

By JOSEPH M. BING, F.R.P.S.

Here at last is an explanation of the various film speed ratings now in use. The author also describes a system of measurement which he recommends as a standard.

FILM speeds are probably the most discussed point in the photographic industry. They are not only an important factor in determining the proper exposure but also they are a most controversial subject due to the wide variety of systems which are in vogue today.

The vast majority of speed numbers are determined in the laboratories under standardized conditions. Though the majority of the systems are based on the same (or quite similar) testing procedures, the results obtained are subject to different interpretations by the various laboratories. This has resulted in many different systems of speed number markings which seem to have become more and more at variance as the film speeds were raised.

It seems unlikely, at this time, that an early international agreement on emulsion speed ratings will come about. A photographer may find one and the same emulsion rated in America at 20° Scheiner or stated to be 636 H&D, whereas in Great Britain or on the Continent it may be marked 26° Scheiner or 2700 H&D.

Many film manufacturers do not list the speeds of their products at all, particularly those who have international distribution. Obviously they have found that their domestic ratings would be misleading to users abroad. Ordinarily such manufacturers will furnish on request a schedule of the proportionate speed, strictly limited to percentage speed comparisons of their own line.

BASIC TESTING METHODS

It is difficult to explain by means of simple illustrations the theory of film speed measurement to those who are not acquainted to some extent with the procedure.

The instruments used in film speed determination are a sensitometer, for exposing the film, and a densitometer, to measure the resultant densities after a specific standard development. To illustrate these instruments by pictures alone would not be very informative. It is therefore necessary for us to be a little technical because film measurement according to most systems is mathematical.

These systems are based on what is known as the "H&D Curve." This takes its name from the initials of two pioneer investigators, Messrs. Hurter and Driffield, who first demonstrated that there was a definite relationship between exposure and density. Due to space limitations it is not possible for us to give anything but the bare outline of the system. Those of our readers who wish to go further into the matter should consult the book *Photographic Sensitometry,* by Dr. L. A. Jones.

On pages 99 and 100 you will find two diagrams (Figs. 5 and 6). Figure 5 (taken from *H&D Simplified,* by C. W. Gibbs, A. R. P. S.) shows a typical H&D curve. Figure 6 illustrates the points used on the H&D curve for different speed determinations.

The curve is obtained by exposing the emulsion to a series of geometrically increasing exposures, then plotting the resultant densities against the corresponding exposure times. In the diagram the exposure increases toward the right, while the densities increase towards the top. The lower left-hand corner in both instances is zero. The curve shows that as the exposure increases, the density gradually rises. The increase of density with increase of exposure is not proportional throughout, so the curve is roughly "S" shaped.

Initially, the density increases rather slowly. This part of the curve is known as the "toe," or the *region of underexposure*. As the exposure increases the curve stretches out into a straight line. Along the straight line the density is proportional to the exposure. The straight line section of the curve is known as the *region of correct exposure*. As the exposures are still further increased, the rate of density increase falls off. This is the "shoulder" of the curve—the *region of overexposure*.

LABORATORY SCHEINER

Laboratory Scheiner speed values are determined by the intensity of light required to produce the least perceptible density (threshold value). In its strictest sense Laboratory Scheiner is a measure of the speed of the emulsion to underexposure. By laboratory tests some emulsions may have very high Scheiner speeds, but it is not possible to use these values in practical exposure because they are not accompanied by sufficient printable density.

Scheiner degrees as obtained by laboratory methods are not satisfactory. They brought about a "Scheiner inflation"—an advertising "exuberance." There has also been a little confusion in the past between Laboratory Scheiner and American Scheiner. The difference between the two will be explained later in this article.

THE DIN SYSTEM

Germany, which has long favored the Scheiner system, evolved the system known as DIN, which is now ordered to be the standard in that country. To differentiate from the older Scheiner degrees, DIN is written as a fraction with the denominator 10. The negative material is exposed to a standardized lamp of normal daylight quality for 1/20 second and developed in a standard M.Q. developer. That much blackening of the negative is taken as 1/10 DIN degree, and can just barely be printed. There are several uncertainties in the practical application of DIN numbers which thus far have prevented universal adoption of this system.

AMERICAN SCHEINER

This system has been employed in the United States for many years as a speed classification based on the experience and results of practical exposure and processing. It classifies quite satisfactorily the speed relationships of modern films. In this sense, American Scheiner is a *symbol* of emulsion speed. The name "Scheiner" has been continued because it has become a sort of popular synonym for "speed rating." American Scheiner numbers are used as an indication of the emulsion sensitivity that is reasonably satisfactory for a wide range of practical conditions, including the development to contrast values recommended and generally employed for the particular type of film. On this basis American Scheiner speeds are fairly comparable to and translatable into DIN, H&D, and Weston speeds, which systems all endeavor to express the normal exposure speed.

The American Scheiner system is not solely laboratory procedure. In determining speeds of films according to this system the approximate values are found in the laboratory to ascertain the general speed classification of the emulsion. After that the results of actual practical exposure trials determine its proper value.

There is much to be said in favor of this method. Firstly, it classifies film speed in a simple manner with due consideration of its practical employment in photographic work. And the use of degrees which indicate a doubling of speed with each three-degree increase does not make for extremely large numbers in expressing the speeds of very fast films. This simplifies the meter scales and listing. The goal at which nearly all speed determinations point is to enable the photographer to obtain correct exposure on his negatives. American Scheiner, by being determined by practical tests, made under practical conditions and processed according to the manufacturer's recommendations is a reliable determination and a convenient rating.

In Scheiner ratings, both Laboratory and American, as well as in DIN ratings, each additional three degrees indicate a

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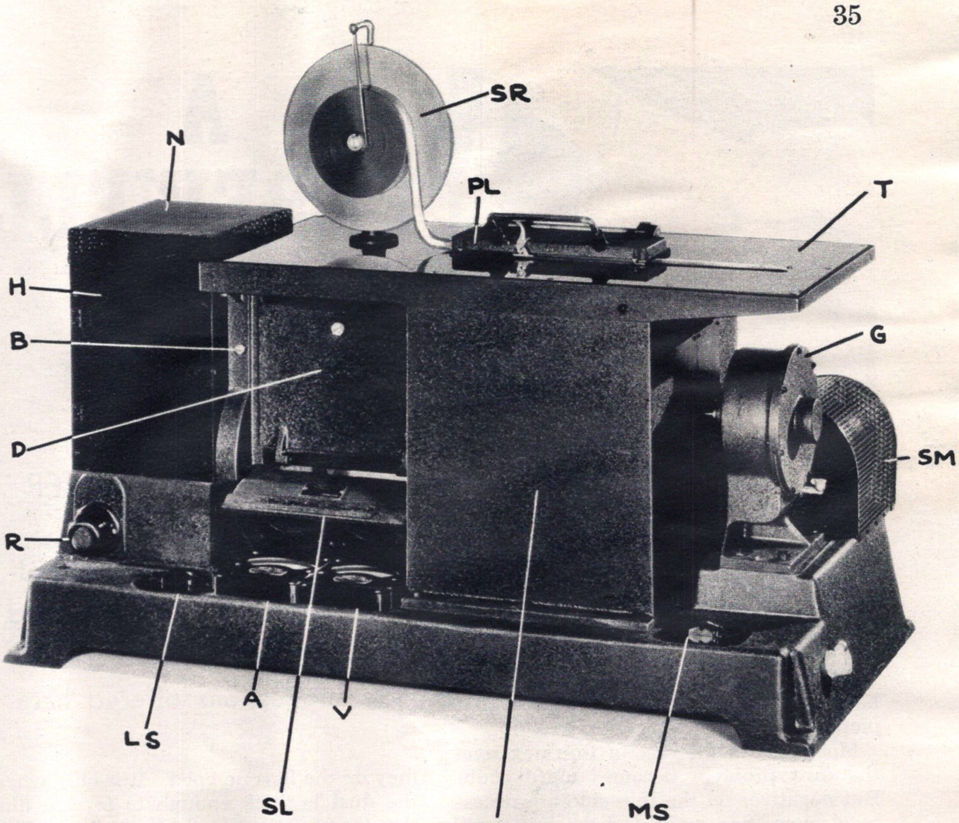


Fig. 2. A front view of the Eastman IIb Sensitometer. This instrument makes a series of geometrically increasing exposures on the film emulsion. The resulting densities are then plotted against exposure times to obtain the H & D curve. Reading clockwise from the left are: H, housing for standard lamp; N, perforated metal guard over lamp housing; SR, supply reel; PL, platen; T, work-table; G, reduction gear; SM, synchronous motor; MS, master switch; DH, casing which houses exposure drum; V, voltmeter; SL, safelight; A, ammeter; LS, light switch; R, hand wheel for rheostat; D, door to light-tight rectangular tube which connects lamp house and drum housing; and B, exposure button. This picture is reproduced from the book "Photographic Sensitometry," by Dr. L. A. Jones of the Eastman Kodak Research Laboratory.

Fig. 3. This model of the Eastman Densitometer is for reading transmission only.

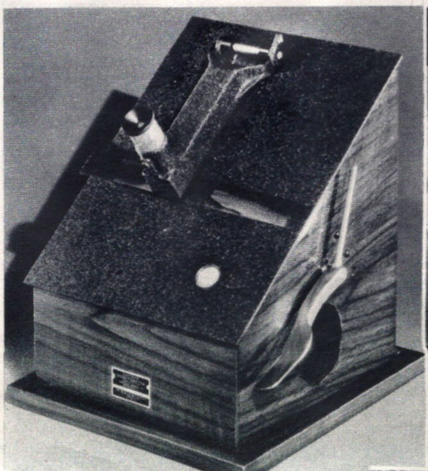
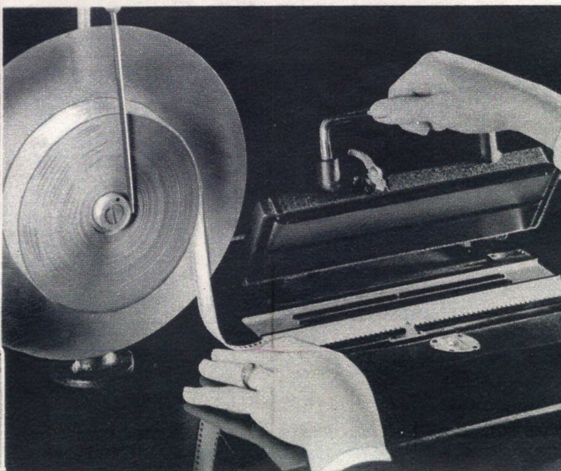


Fig. 4. Close-up of the Type IIb Sensitometer, showing film guides and platen.

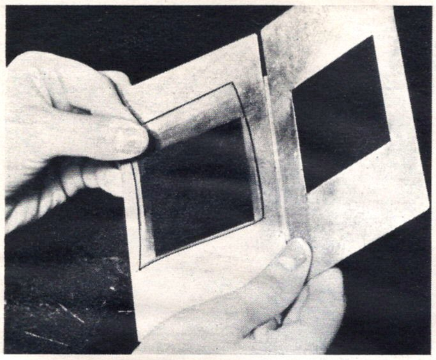


A FAREWELL TO DUST

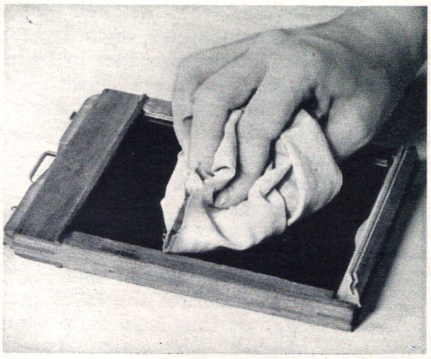
by R. DeWITT MILLER

Amateur Photographer, Los Angeles, Calif.

The time you waste in spotting prints can be reduced amazingly if you'll follow the suggestions offered here.



The absence of glass makes this metal negative carrier very nearly dust-free.



Film holders and slides should be wiped with a slightly oily rag before loading.

DUST spots on unexposed film, developed negatives, prints, and enlargements are among the most aggravating of all the petty troubles which make photographers' lives miserable. A few well-placed dust spots will greatly weaken the vital first impression which has so much to do with the success of a picture.

Moreover, in the case of thin negatives the dust problem becomes more acute. But negatives on the thin side are necessary where fine grain and the best tonal gradation are desired. The factors involved form a vicious circle.

Many photographers believe that dust is inevitable, like death and taxes, unless you can afford expensive equipment and a well-planned studio. They are resigned to long hours of tedious work with a spotting brush and an etching knife in order to remove the insidious little white and black spots from their prints. The cause of this attitude is a combination of photographic superstition and the lack of a systematic anti-dust technique. It's just as easy and just as cheap to keep prints free of objectionable spots. And here's the story.

Many people have the mistaken idea that dust on the lens of the camera will affect their negatives. Particles of dust scattered about the surface of the lens don't affect the negative at all, although they do the lens no good. It is only when the dust is thick enough to form a film that the negatives begin to get hazy. This condition occurs only when you're working in a very dusty environment, such as in the desert. In such cases, the dust trouble can be avoided by simply stuffing your handkerchief into the lens shade, or by holding it over the lens, except when shooting. Of course, you must be careful not to rub the lens with the handkerchief and thereby scrape it with minute dust particles. A lens cap is a distinct aid at such times, also.

Barring unusual conditions, the trouble begins with dust particles on the film. These cause unexposed or undeveloped dots on the film when it is processed, and result in black spots on the prints. Dust can get on the film when it is being put in the camera, while it is in the camera, when it is being removed for developing, and when it is being placed in the developing tank. If the dust gets on after the film has been exposed, it often causes spots of intensified development, resulting in white dots on the prints.

To avoid the first of the dangers just enumerated, don't load your camera in a dusty place. If you are using cut film, wipe out your holders each time they are loaded, with a rag which has just a few drops of oil or furniture polish worked into it. Don't forget to wipe the slide. Occasionally blow out the holders with compressed air at an auto service station. It is also a good plan to varnish the table where you do your loading and wipe it with an oily rag (not *too* oily) before beginning the loading operation.

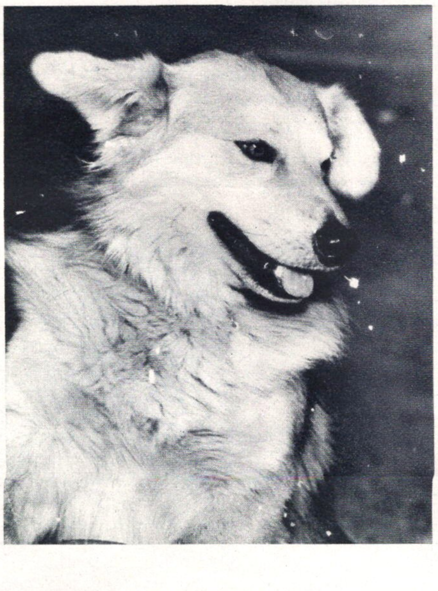
If you use pack or cut film, be sure to keep the dust off the slide when you pull it out to make an exposure. If you drop it, don't fail to wipe it thoroughly. Do the same with holders which have lain in dusty places. A dirty slide or holder will almost invariably result in dust spots on the negative.

Users of roll film should see to it that the interiors of their cameras are dust-free before loading. If you're not near a gas station (with its compressed air hose), carry an inexpensive ear syringe with you.

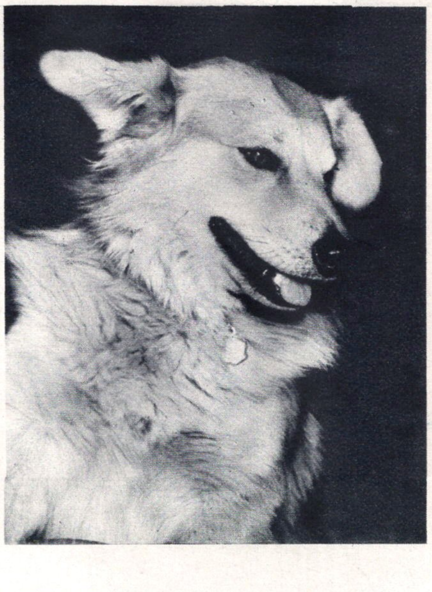
When it comes to handling film before it is placed in the developer, the only solution is to keep the darkroom dusted.

(Continued on page 102)

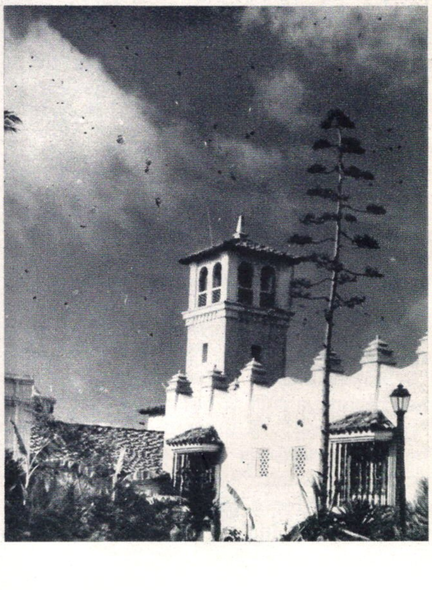
The white spots in this enlargement came from dust on the negative carrier glass.

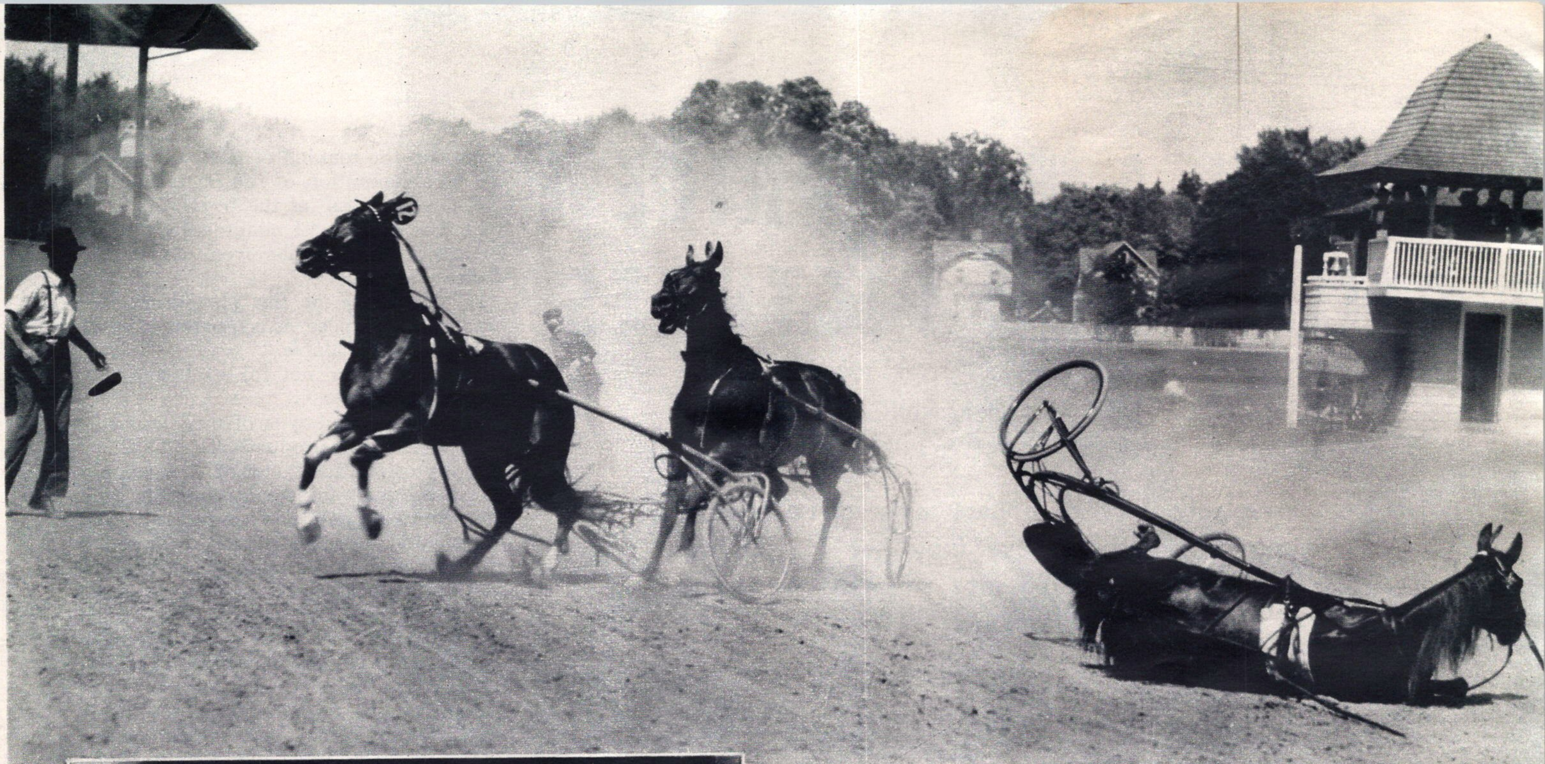


The same negative produces a spotless print when a glassless carrier is used.



Dust on an undeveloped film causes clear spots on the negative. These print dark.

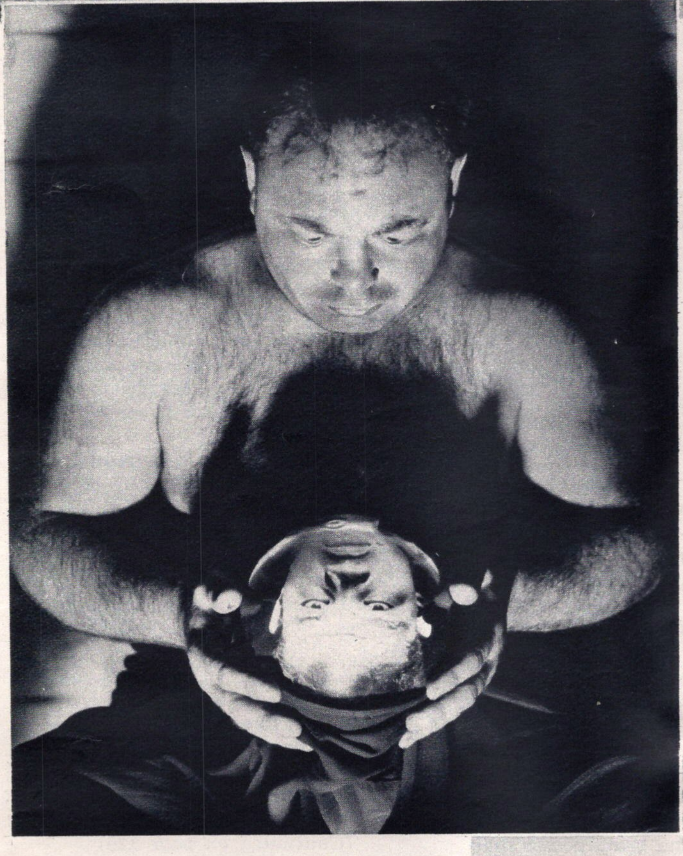




"Grief at Goshen" is the title of this dramatic action shot by cameraman Sam Falk of Wide World Photos. He used a 4 x 5 Speed Graphic and Agfa Superpan Press film. Exposure was 1/235 second at *f* 8. Alertness was the prime factor in getting this picture.

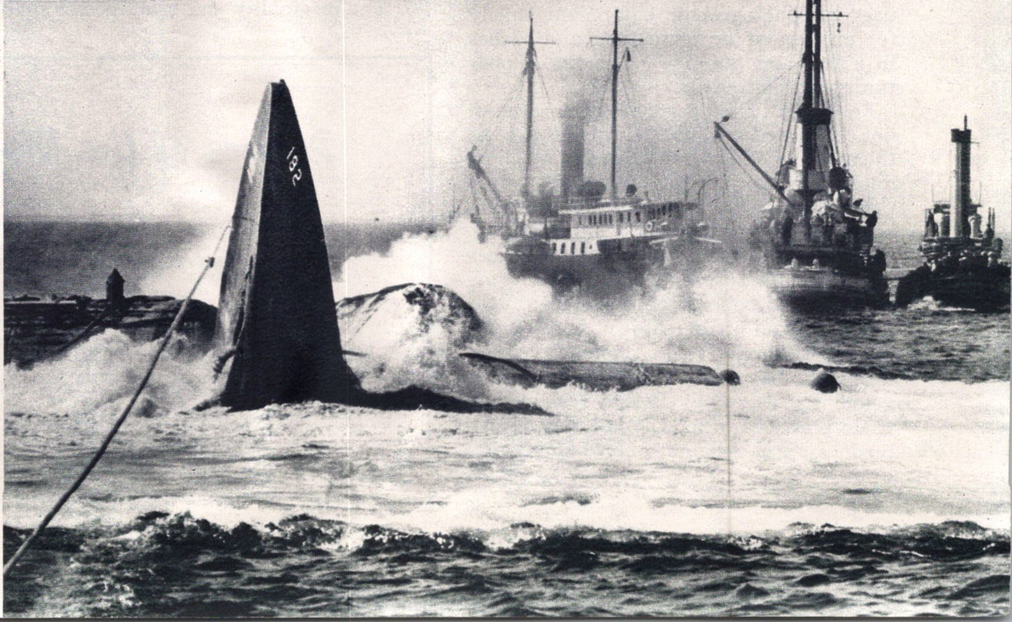
NEWS PICTURES OF THE MONTH

Some news pictures must be secured as the event occurs, while others, of people and things in the public eye, are posed. This month we present both types of pictures. Robert Dorman, General Manager of Acme Newspictures; Harry Baker, Editor of International News Photos; and Frank F. Gilloon, Sales Manager of Wide World Photos, made the preliminary selection of these pictures.



Trying to get a "different" picture of Tony Galento before his bout with Louis, Arthur Sasse of International set up this amusing scene in which Galento sees his opponent in a crystal globe. Sasse used a 4 x 5 Speed Graphic, Agfa Plenachrome, and a G-E No. 21 Synchro-Press bulb. Exp., 1/200 sec., *f* 16.

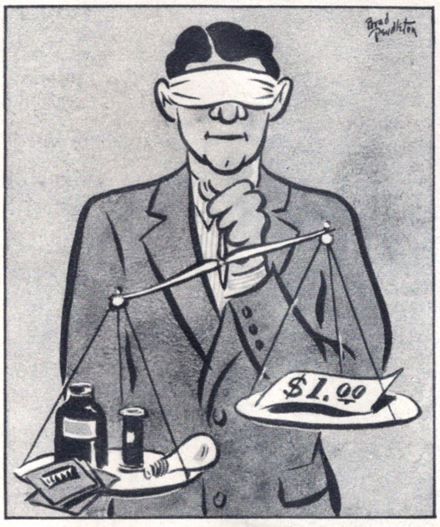
One of the most remarkable news pictures of the year, released by Acme, is this shot of the submarine "Squalus" as it broke from its chains during salvage operations, burst to the surface, and sank again rapidly.



ASK A FAIR PRICE FOR YOUR PICTURES

by J. W. McMANIGAL
Agricultural Photographer, Horton, Kansas

Free-lance photographers are often disappointed with the price they get for pictures. The author suggests standard rates.



Are editors fair judges of picture prices?

THE chaotic condition in the matter of prices for photographs for publication, can be placed squarely on the shoulders of free-lance photographers of the country, proprietors in an industry which has grown to gigantic proportions.

Perhaps no business or profession in the United States (unless it is free-lance writing) has such a large proportion of amateurs and novices following it, or attempting to get into it. Most amateurs, and many professionals, have no cost accounting system whatsoever, and are satisfied to dispose of their material at whatever price it will bring. They count any cash returns which will help to purchase more photographic material as so much to the good. This places the entire profession in a position that would be regarded as ruinous in any other line of manufacturing (and that is really what it is).

What to do about it?

Frankly, I have no panacea. At this time I can offer only a few observations, hoping that eventually discussion will evolve some established system of rates for photographs sold for publication.

But upon what basis should such a system of charges be made?

Other manufacturing industries base their selling charges on cost of production plus a fair profit. In free-lance photography this would mean cost accounting, which is purely a matter of bookkeeping insofar as the professional photographer is concerned. But it is rather difficult in the case of the amateur who uses his photographic equipment chiefly for enjoyment or recreation, and cashes in a little on the side when the opportunity presents itself.

Free-lance photographers generally are not concerned so much with what it costs them to produce photographs as how much they can get for their work. Figuring costs is purely a matter of bookkeeping, arithmetic, and clear thinking. Planning a *fair* schedule of selling prices for publication presents many more complications. I believe there is a great field for discussion of the subject, both on the part of those who make photographs and those who buy them, with the idea of developing eventually some established trade practices which the industry, trade, business, profession, art, or whatever you may choose to call it, needs very badly.

Some of the factors upon which selling prices are based are:

1. What the buyer is willing to pay (by far the most pertinent item that exists at present).
2. What circulation the purchaser will give the photograph.
3. How prominently it will be featured.
4. Importance of the photograph to the finished work.
5. How difficult it is to duplicate or replace.
6. The purely mechanical labor of producing the photograph.
7. The originality and brain power that went into the making of the photograph.
8. The reputation of the photographer.
9. The "bigness" of the buyer.
10. The expense of maintaining the selection of photographs from which the choice was made.
11. The value of the photograph for the buyer's purpose, as compared to other photographs available.
12. Whether or not for exclusive use, first rights, etc.
13. Number and type of models used.
14. The cost of production.

In my estimation factors 2, 3, 4, 11, and 12 are the most important points to both the photographer and purchaser, and they, with due consideration to factors 5 and 14, are the ones upon which charges should be based. With them in mind (with the exception of factor 14, which can hardly be taken into consideration in a general discussion) the following schedule is offered as a possible basis for selling prices. It does not take into consideration the poorly-defined points listed above, because these are mostly applicable to "big name" photographers alone, and are likely to lead the beginner into complications. Also the matter of "bigness" of the prospective buyer is disregarded entirely, as this item does not and should not affect the photographer.

The main disadvantage of this schedule is undoubtedly that, stripped of all non-essentials as it is, it is still far too complicated.

Class A (lowest price): Photographs for editorial use or advertising in publications of restricted circulation in one small newspaper, small magazine, or for mailing pieces, catalogs, house organs, etc., of purely local coverage, "evergreen" nature. Put in your own idea of price—shall we say three dollars?

Class B: Editorial use in publications of nation-wide circulation but to a restricted field, advertising in several newspapers or small magazines, or for mailing pieces, catalogs, house organs, etc., of quite widespread distribution but going to limited classes of people such as retail grocerymen, factory hands, business executives, oilfield workers, etc.; routine spot news for larger newspapers, and for cover pages on material defined in Class A. How about five dollars?

Class C: Illustrations for magazines of nation-wide general circulation or routine photographs in advertising running in small size in one or more publications

(*Continued on page* 129)

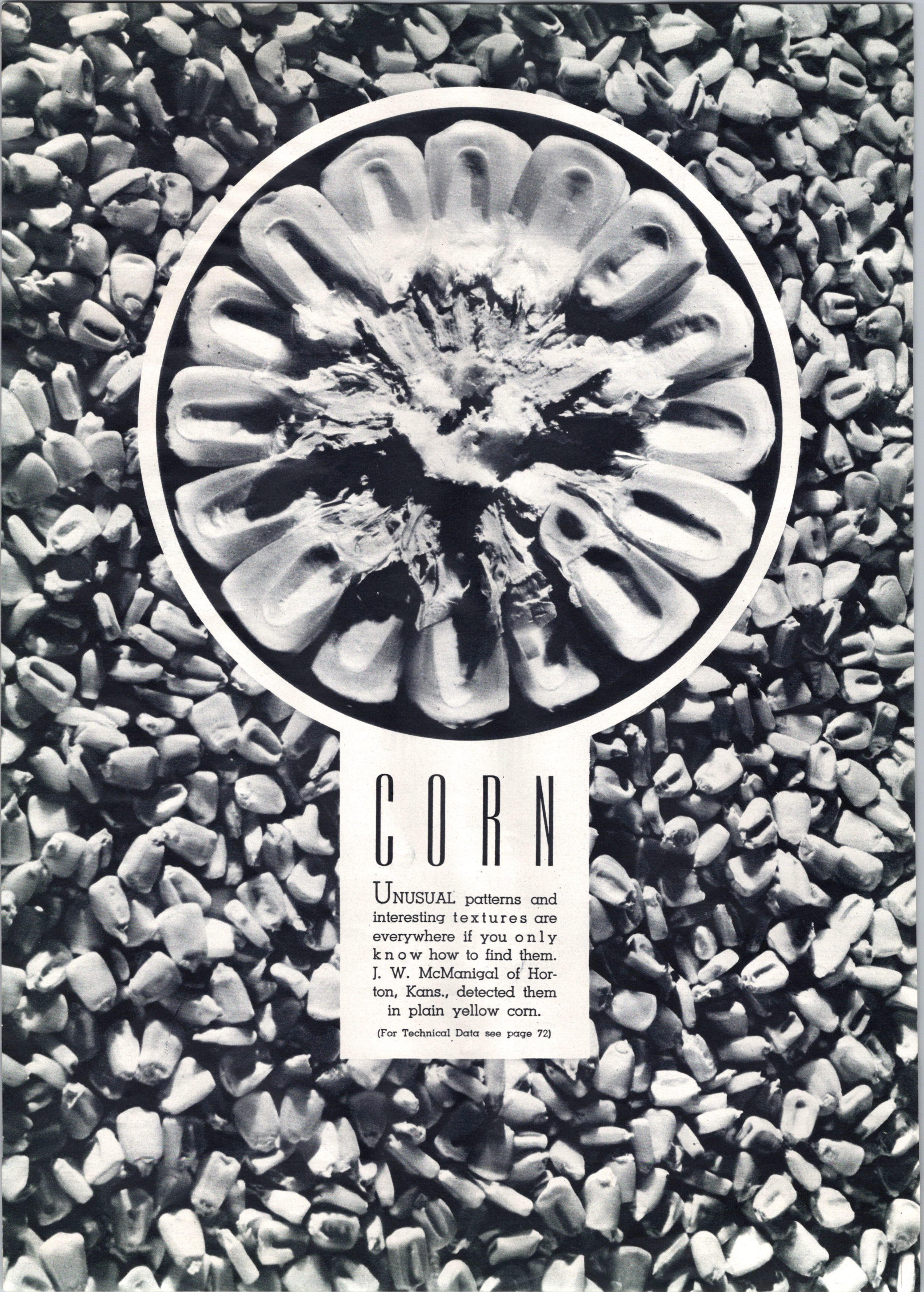
Picture of the Month

(opposite page)

SUMMER IN HOLLAND..........by J. F. Abbott

Simplicity is the keynote of this charming picture. The dark vanes of the windmill dominate the composition but photographer Abbott balanced them by placing the group of girls in the picture, thereby also adding a touch of human interest. [For Technical Data see page 72]

SUMMER IN HOLLAND by J. F. Abbott



CORN

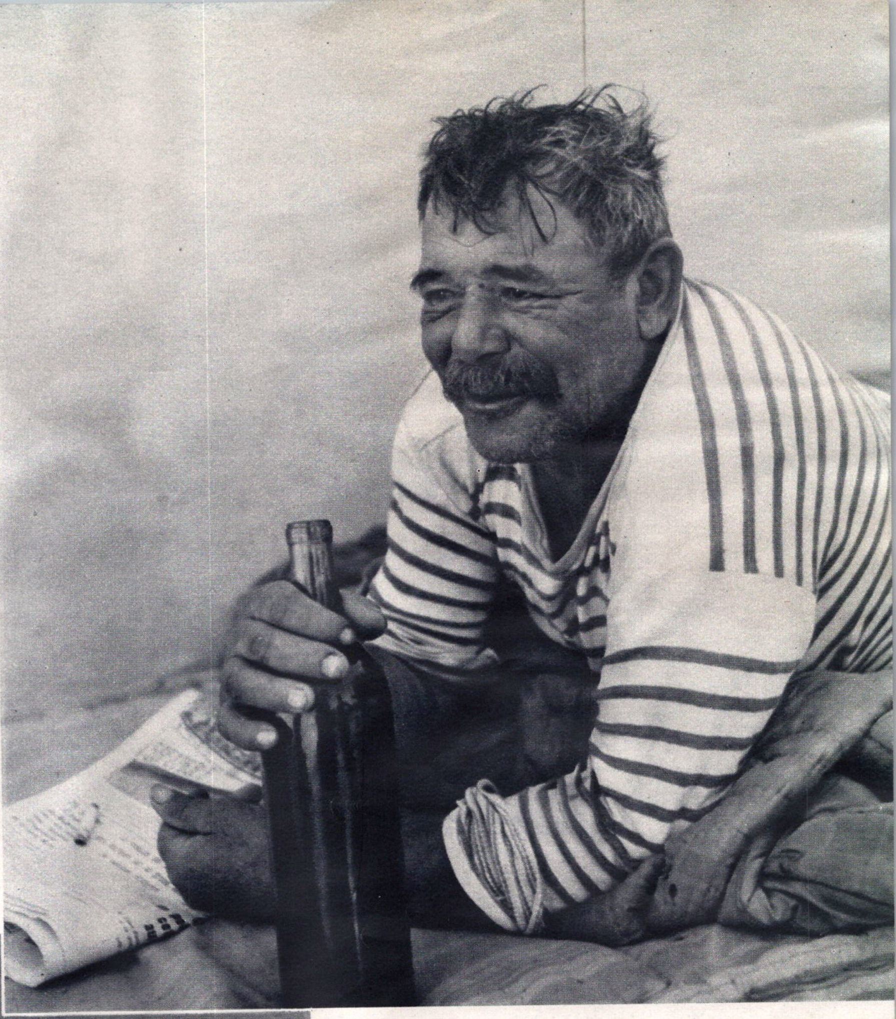
UNUSUAL patterns and interesting textures are everywhere if you only know how to find them. J. W. McManigal of Horton, Kans., detected them in plain yellow corn.

(For Technical Data see page 72)

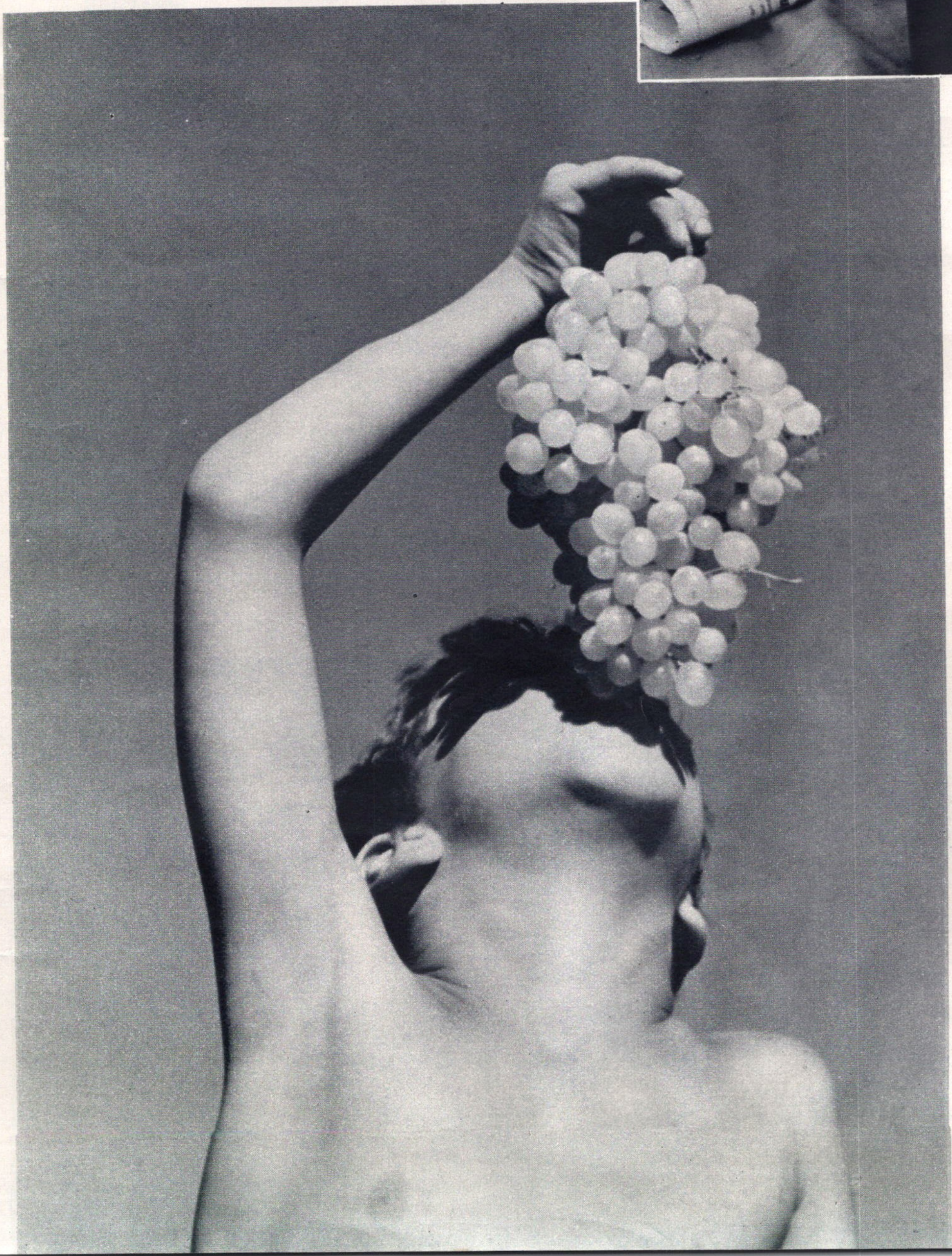
WINE

AN inspiration to artists ever since antiquity, wine and grapes are still inexhaustible subjects. Here two photographers approach these themes from widely different angles.

(For Technical Data see page 72)



FISHERMAN .....by
Relang, Paris, France

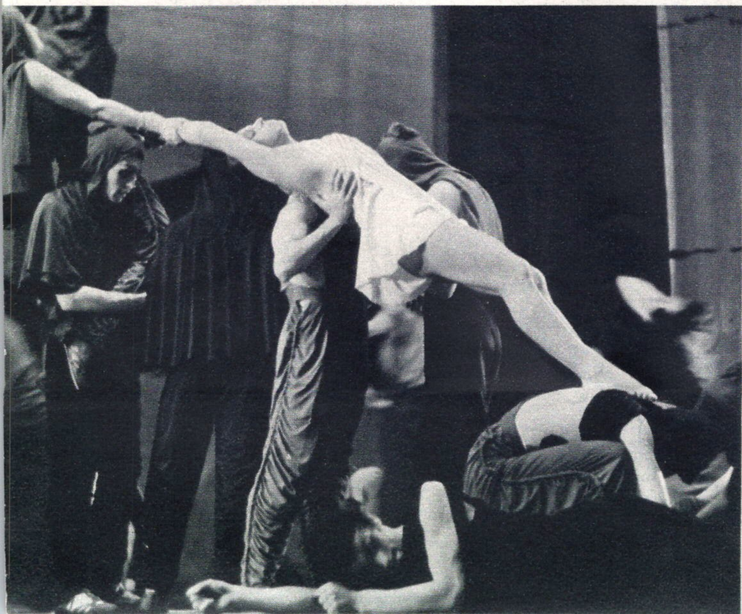


YOUNG BACCHUS ....by
Jose Alemany, Pittsburgh, Pa.

Ballet

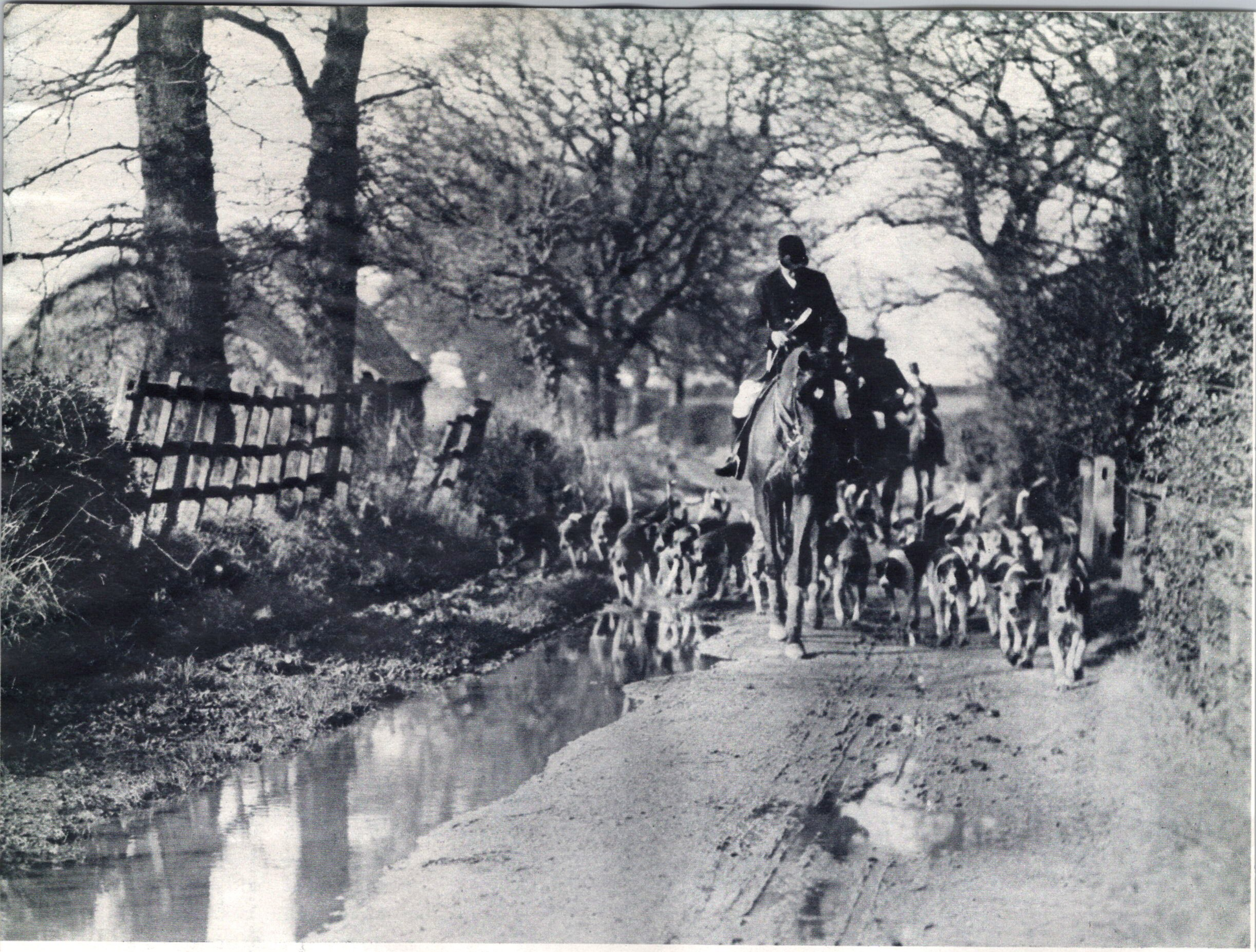
LITERALLY operating a camera with each hand, George Leavens of Hollywood made a remarkable series of action shots picturing the famed ballet. Some of his pictures were taken from the prompter's box, others from the dress circle. All have captured the grace and eye appeal of the dramatic pantomimes.

(For Technical Data see page 72)



Russe

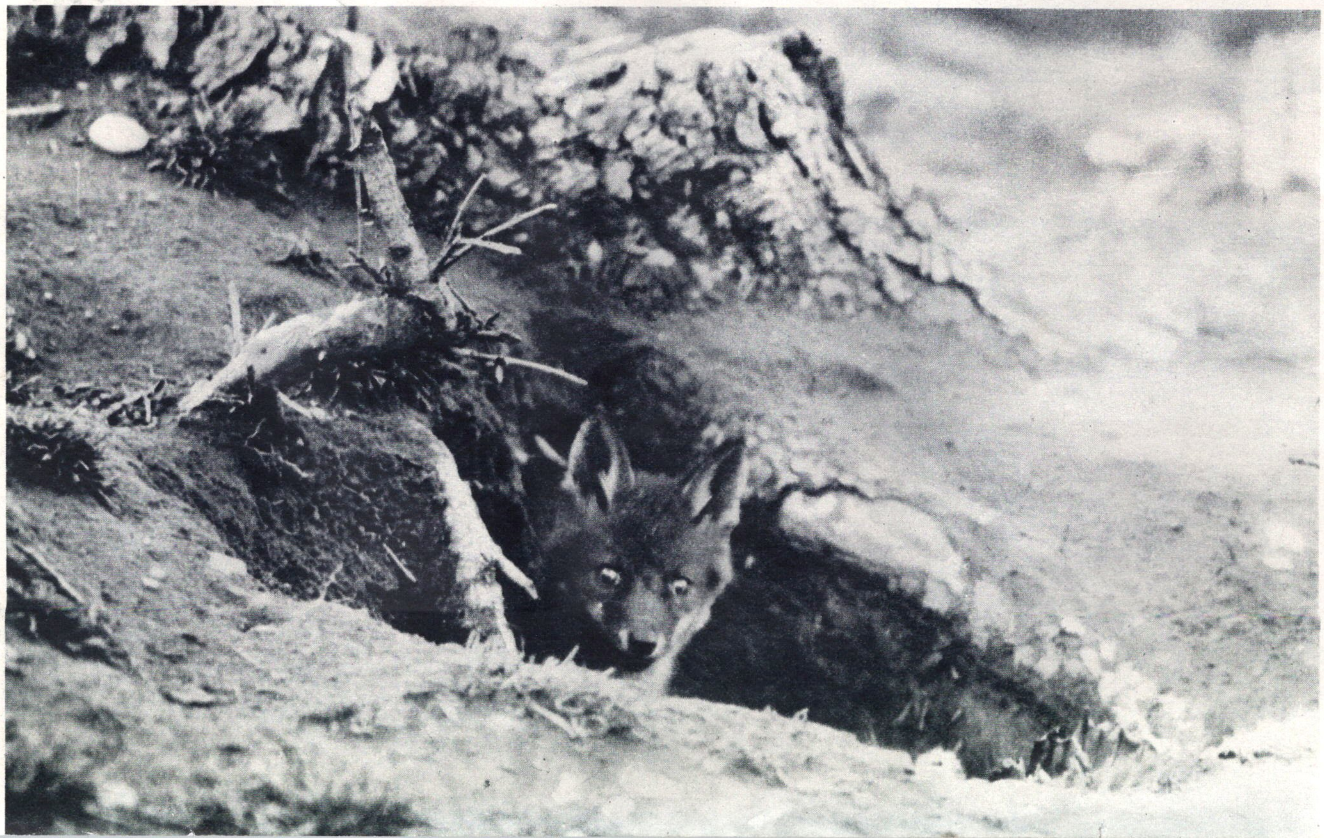
Equally skilled in the traditional ballet and the dramatic pantomime, the Greater Ballet Russe de Monte Carlo is known from sea to sea. Its fifty dancers offer a repertoire of approximately twenty ballets. It visits about 100 American cities.

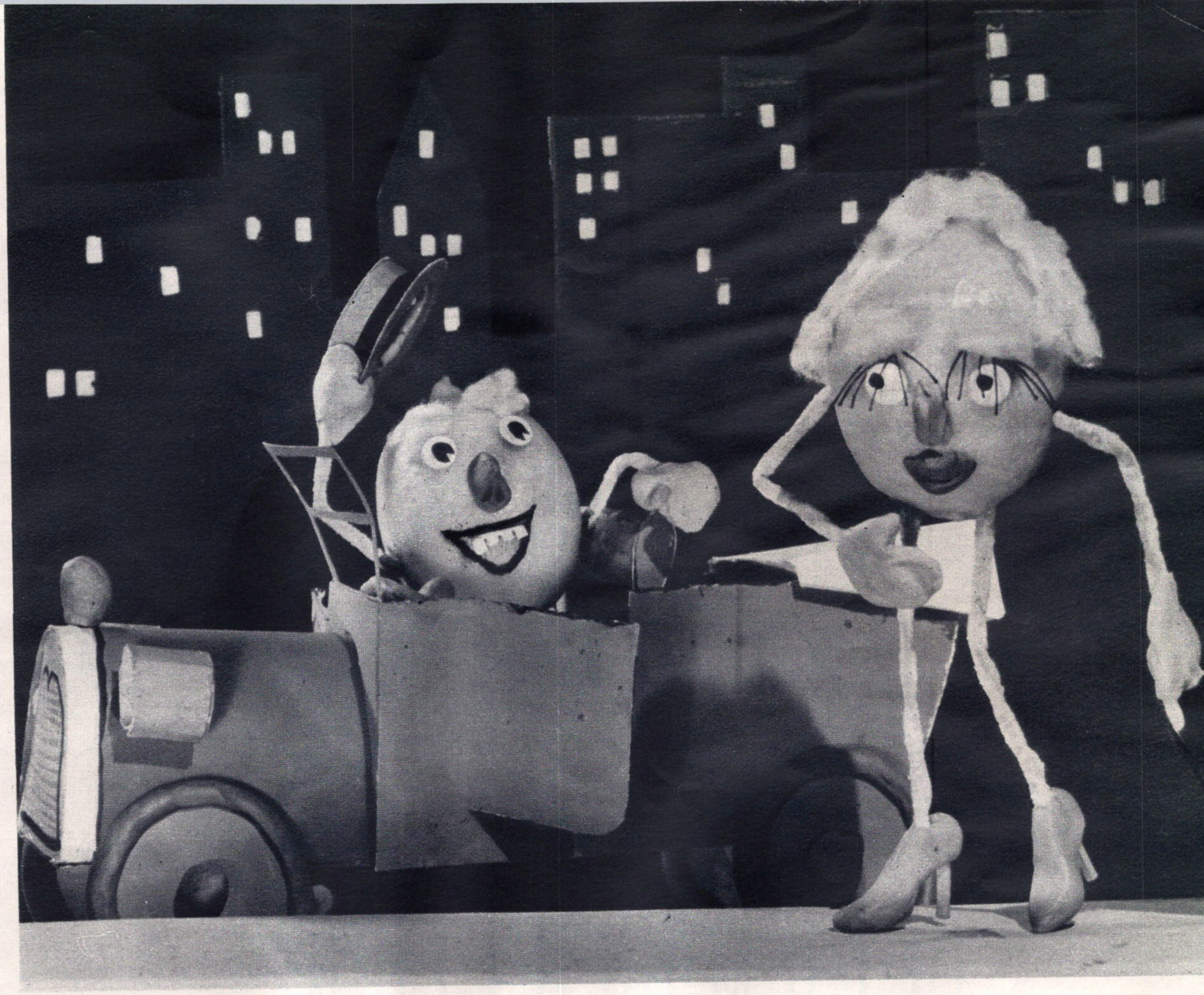


FOX HUNT

Luck was with John H. Vickers, F.R.P.S., of Oxford, England, when he met these hunters on a drab fall day which seemed to offer no picture possibilities. But it took a lot more than luck to coax the fox cub from its hole and have it pose for a nature study.

(For Technical Data see page 72)

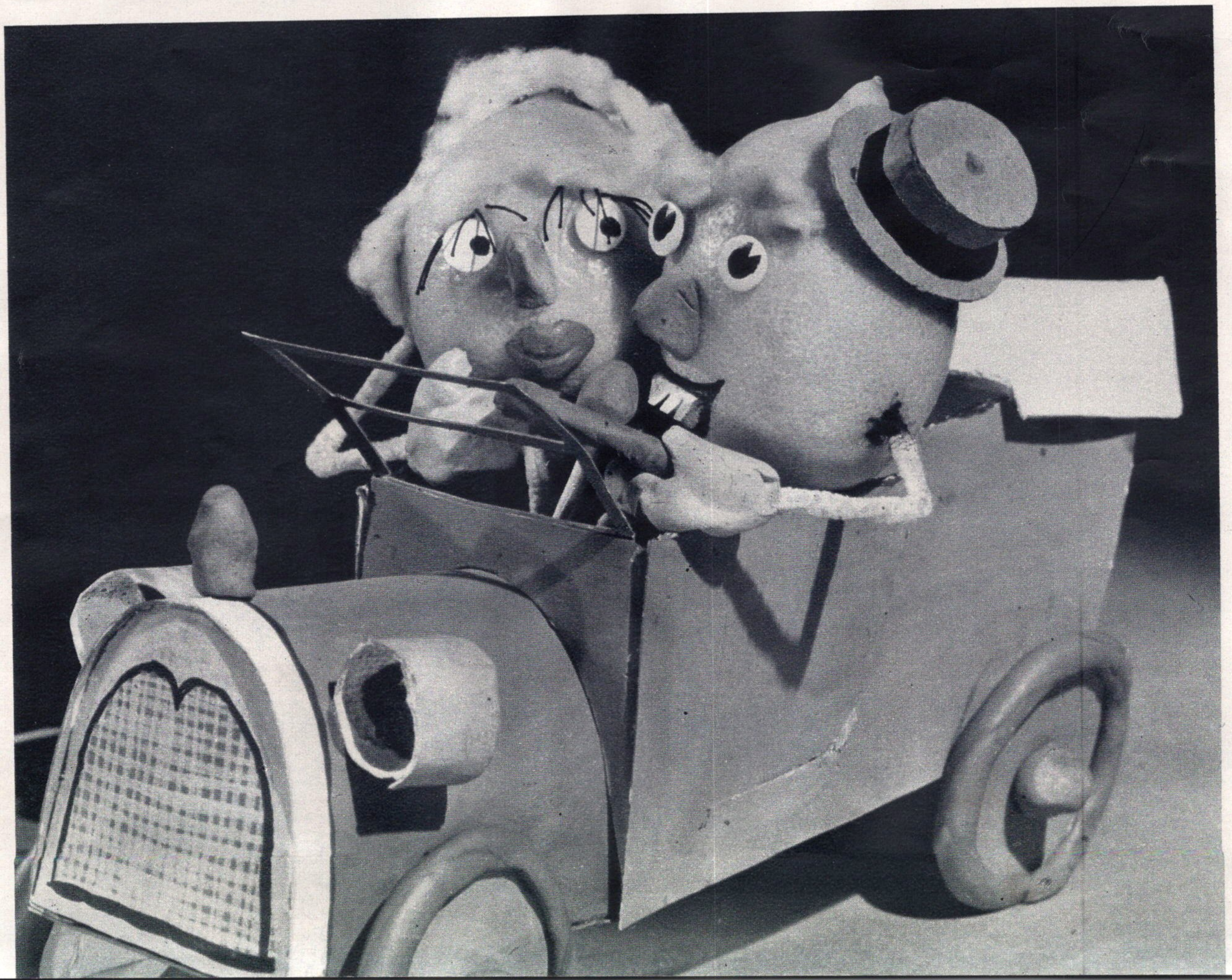




FLIRTATION

Story-telling tabletops are an amusing branch of photography, whether you are able to create your own sets or collaborate with others. Advertising artist George A. Thompson of New York City made his own models from lemons, cardboard, clay, pipe cleaners.

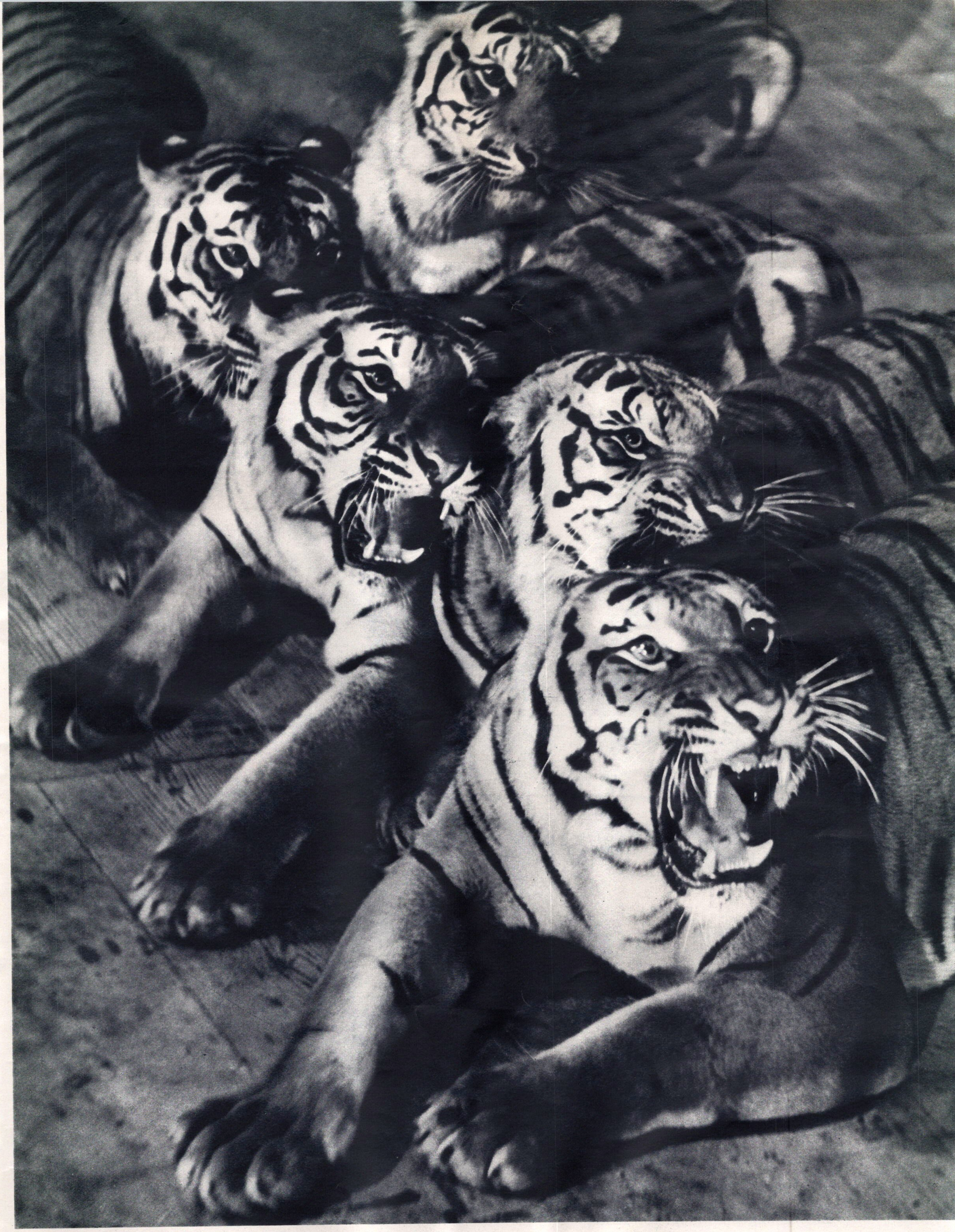
(For Technical Data see page 72)



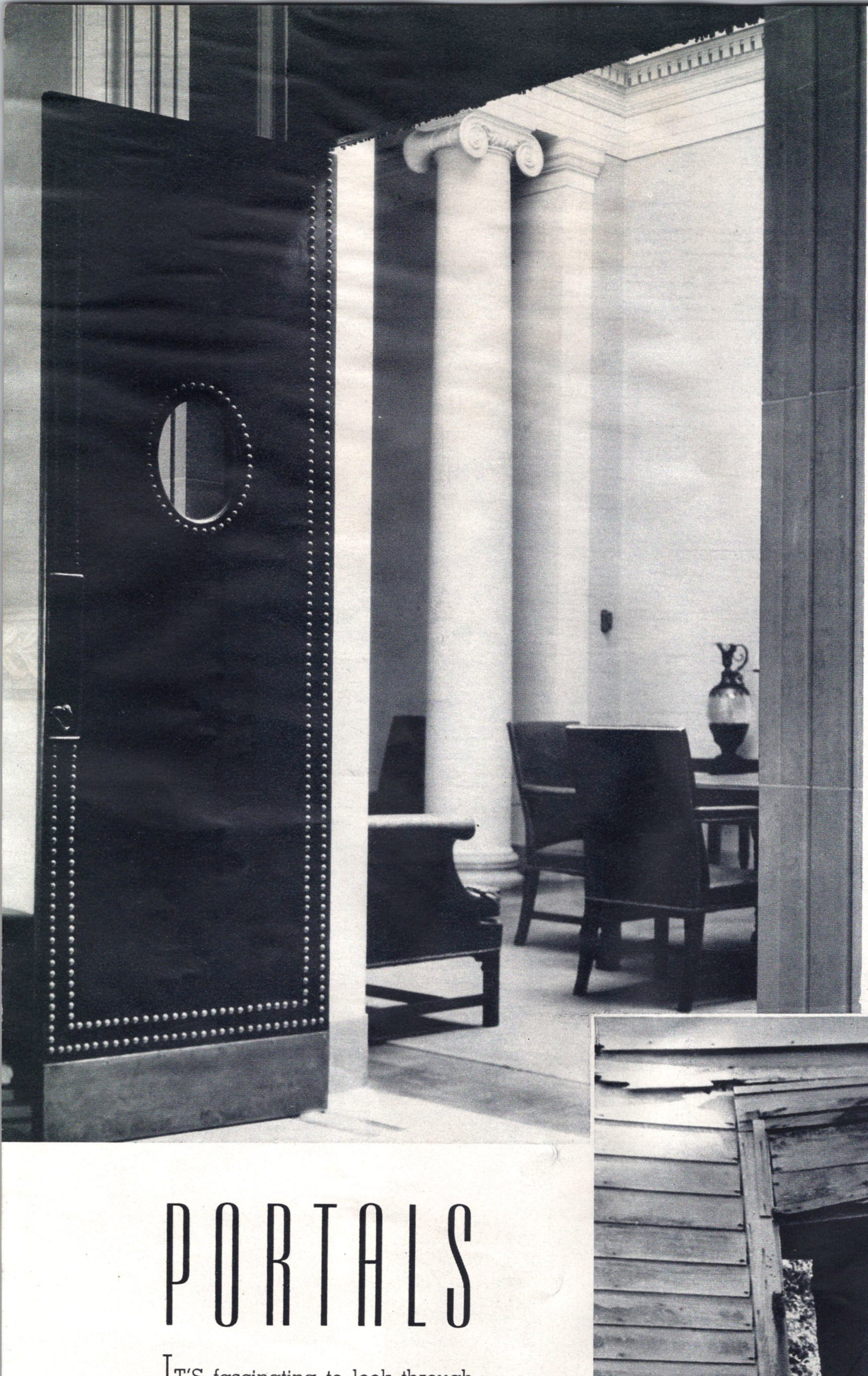
USING long time exposures, employing little tricks such as closing the shutter to block the light of passing vehicles, Frank Cleveland of New York City made these excellent night shots. They are full of good contrast, interesting detail, and transparent shadows.

(For Technical Data see page 72)

ILLUMINATION

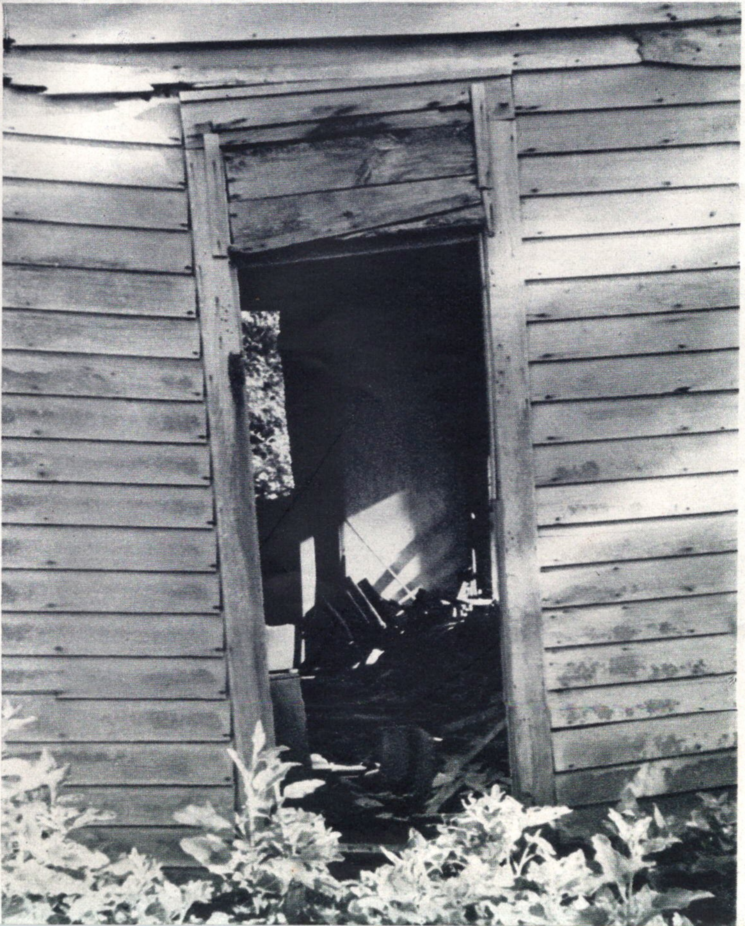


TIGERS by Martin Munkácsi



LIBRARY ....by
George Hukar, Detroit, Mich.

DOORWAY ....by
Robert McCullough, Hoopeston, Ill.



PORTALS

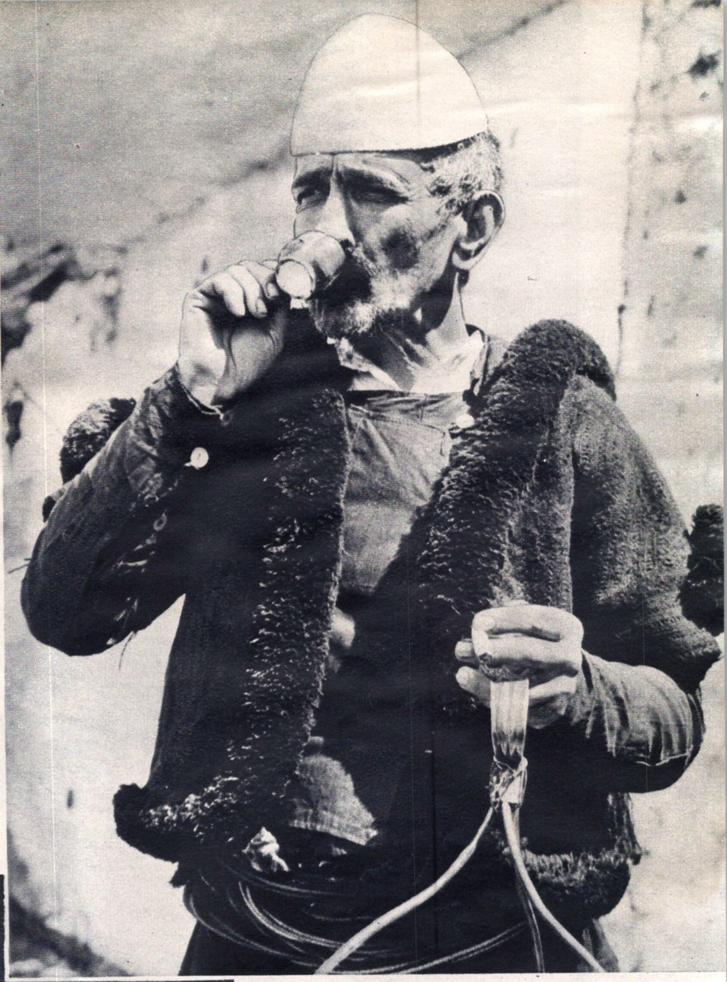
IT'S fascinating to look through an open door and it offers interesting problems to the camera. To hold detail in both the "frame" and the interior, a proper balance of exposure must be found.

(For Technical Data see page 72)

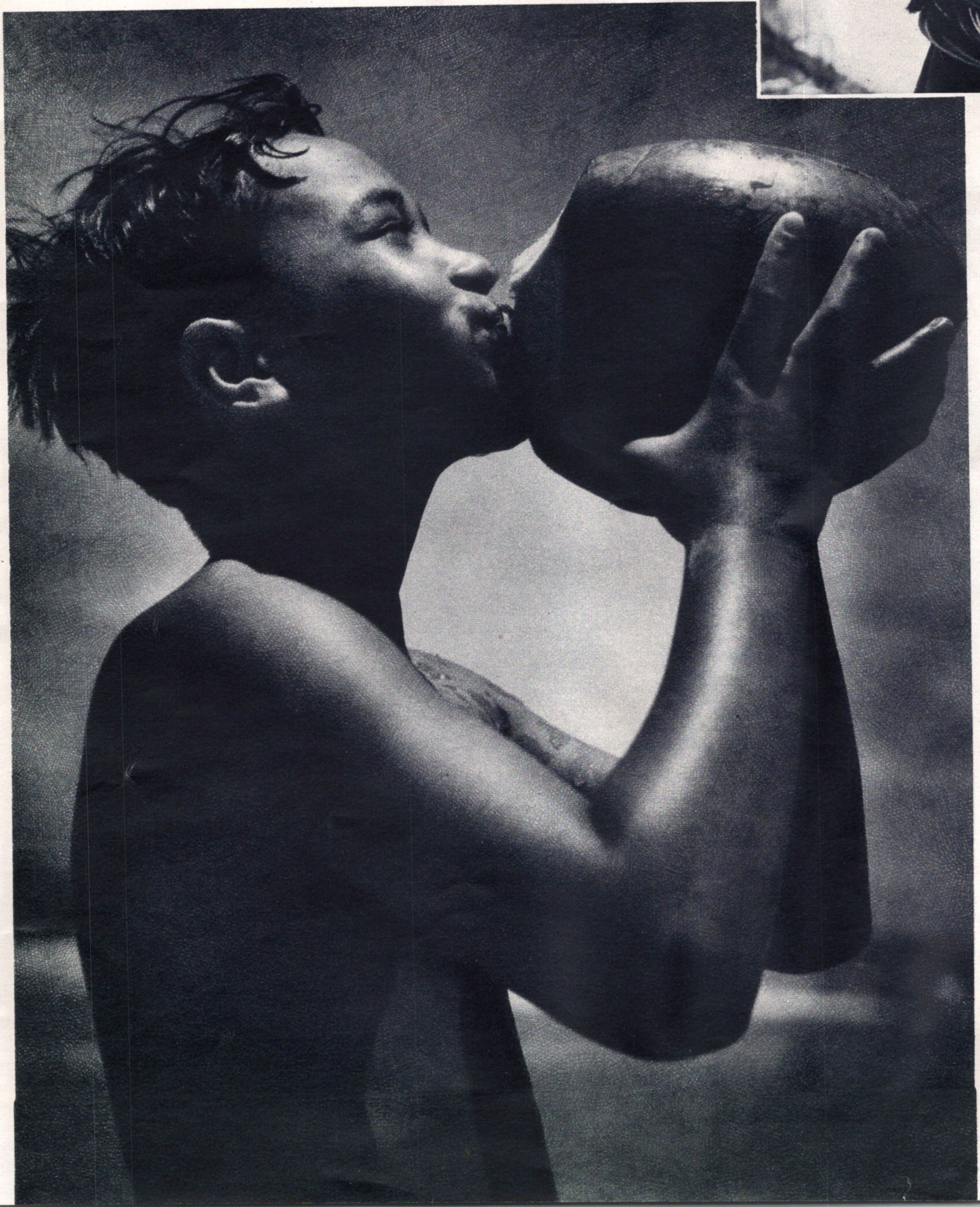
CONNOISSEURS

Few things are apt to characterize natives better than their habits of eating and drinking, and few subjects have a stronger human interest. It is revealing to see an Albanian shepherd handle a dainty demitasse, or a Hawaiian boy enjoy a cool drink.

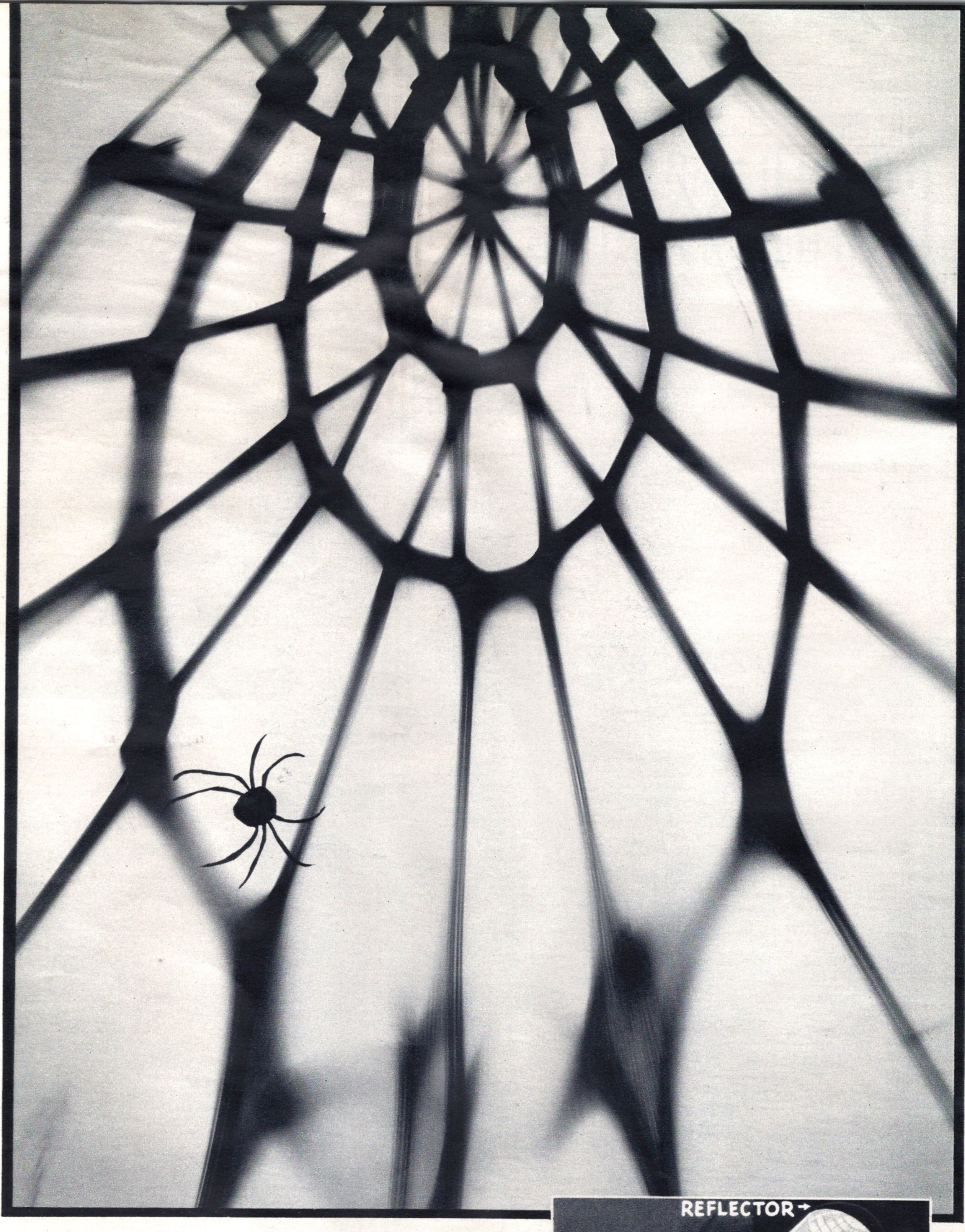
(For Technical Data see page 72)



REFRESHMENT ....by
Bernd Lohse, New York City

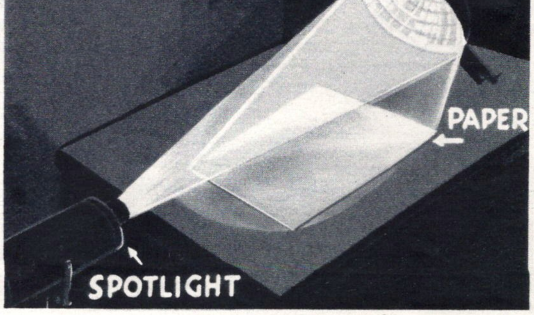


HAWAIIAN BOY ....by
M. Arthur Robinson, Berkeley, Calif.



PHOTOGRAM

MADE directly on sensitized paper without the use of a camera, this picture by Fred Korth of Chicago is an interesting example of one of the oldest methods of picture taking—revived of late and acclaimed as "modernistic." Diagram shows the setup for making this unusual picture.

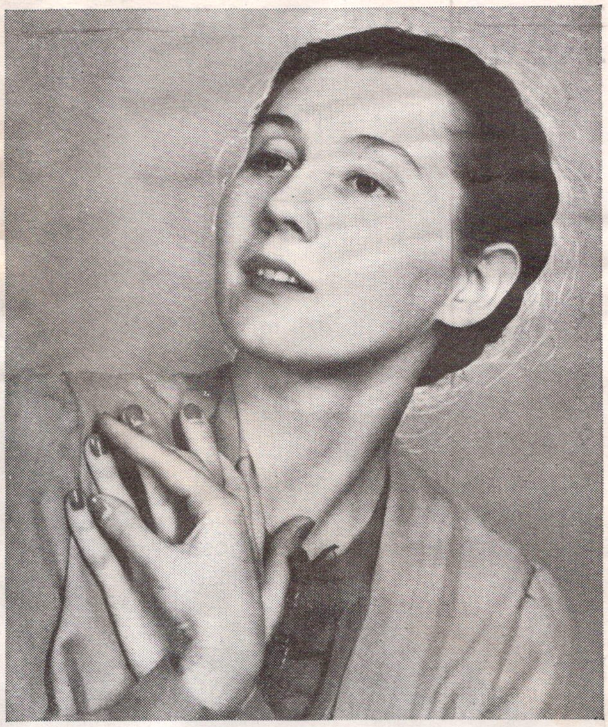


(For Technical Data see page 72)

POINT OF VIEW MAKES THE PORTRAIT

by STAN JENKINS
Illustration Photographer, Utica, N. Y.

You have an infinite number of head and camera positions from which to choose the one doing most justice to your subject.

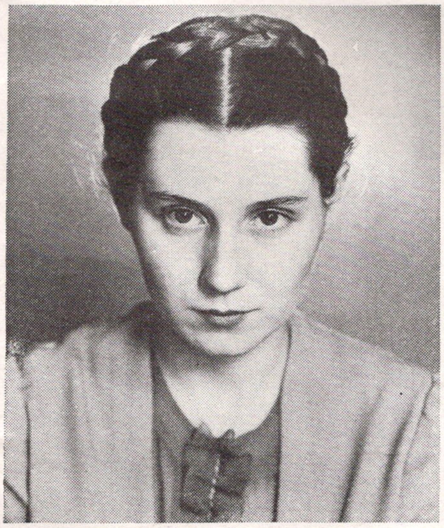


The effect projected in this portrait was achieved with a low camera angle and by tilting the camera sideways. A groundglass back helped in composing this picture.

THE seventeen illustrations on the next two pages show how the appearance of a face is altered by seventeen changes in point of view. Other points half way between these will add further to the variation. Tilting the head forward or back in each of these positions will add still more. By changing the expression, dress, hair-do, accessories, background, and lighting, you could make hundreds of additional shots, no two alike. The camera can be moved, or the subject can be moved in relation to the camera, but in any case a change of only a few inches will make a difference in the contours and the relation of one feature to the other.

Not only is the shape of the head and face altered but the shape of eyebrows, nose, mouth, and jaw is also changed with every change of camera view-point. For instance, when looking up we may see that a mouth appears to droop. If we look down at the same mouth, it may appear straight or even have an upward curve.

During the constant movement of everyday life we rarely have an opportunity to view a face from any one point long enough for its appearance from that point to register. We see a face from many angles and with many expressions. The *sum* of these *different images* make up the *impression* in our minds of that face.



Distortion was avoided in this shot by having the subject incline her head forward and lifting the camera to nose level.

Thoughts and emotions are reflected on a face and there is a constant play of movement and expression like a gentle breeze among the leaves of a tree. Therefore, a motion picture probably will give an impression of a face more nearly like our mental impression.

A still camera catches only one of these many changes. When you take a pot-shot at a face, carrying its fleeting expression of the moment, reflecting the particular light shining upon it, set out from or buried in the background, and viewed from only one of a hundred possible view-points, there is no reason to be disappointed if that particular combination is not perfectly satisfactory. You can capture only one combination at a time but the variety of these possible combinations is without number.

For this series of illustrations the camera was placed about six feet from the model's face. For the top row, Fig. 1 to Fig. 5, the camera was between 20 and 24 inches below the model's eye-level. For the middle row the camera was at approximate eye-level and for the bottom row it was about 20 to 24 inches above her eye-level. While these differences are not extreme and the results are all usable, they show you that the position of the camera does have considerable effect.

No special make-up was used and no special attention was given to lighting. Two No. 1 Photofloods were used on one side and one No. 1 Photoflood on the other. A diffused spotlight was thrown on a white screen at the back of the head. This had to be moved in line with the head and lens for each move of the camera or model. It is well to bear in mind that every time you alter the position of the camera the angle of the light and character of the background is also altered. The illustrations provide most interesting comparisons and will fully repay thorough study and analysis. The more you look, the more you see! They are arranged for comparison from side to side, from top to bottom and from corner to corner.

The difference in the angle of the shoulders is the first point which strikes the eye but closer study will reveal that other features are altered in much the same way. Having fixed these results in your mind you can undertake your next portrait with more confidence because you will know what to look for and what to expect. You will naturally select a point of view which will show the features of your subject to best advantage. And don't forget that point of view will also exaggerate features which the subject may prefer to have subdued.

But let us suppose that you were to use this same model. I would then suggest that you watch the neck. Some of these points of view do not flatter this feature, but in others, particularly in the bottom row, it is taken care of very nicely. I believe that a study of the subject is far more productive of satisfactory pictures than a study of photographic equipment. For instance, you can get similar effects to those shown here with almost any old camera, lens, shutter, film, developer, and paper.

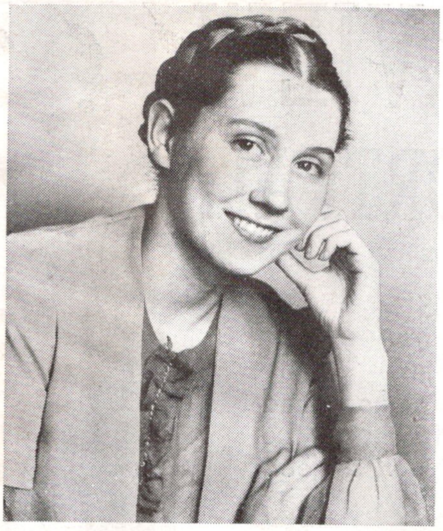
To sum up, it is evident that some aspects of a person's face are preferable when seen from a low point, others from eye-level, and others from a higher point; that the type of face should have considerable influence in your selection of the point of view; that the personal preference of your subject should be consulted because she may not like what you like. Therefore, if you tear these two pages out and mount them you will likely find them valuable, not only for reference, but to show your subject the differences made by different points of view.—■

POINT OF VIEW MAKES THE PORTRAIT

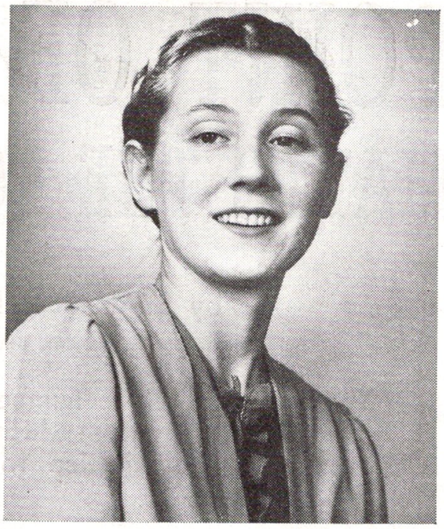
by STAN JENKINS

Photographs by the Author

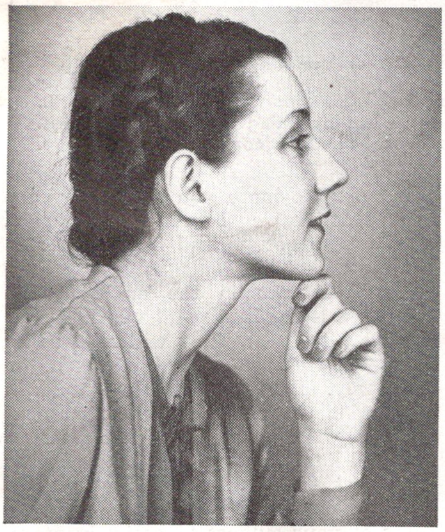
A study of these pictures, discussed on page 51, will reveal how point of view emphasizes or subdues facial characteristics.



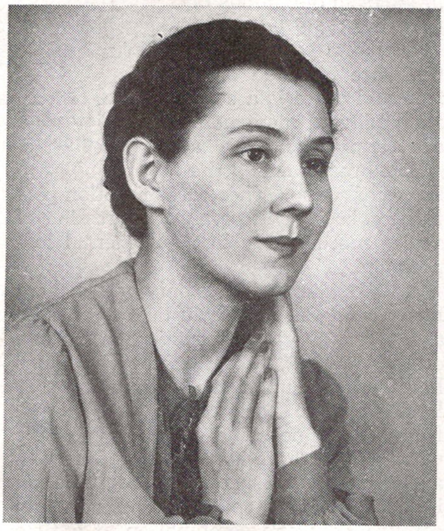
1 Here the camera is low and the subject is leaning forward. Compare this with No. 2 where the subject is erect.



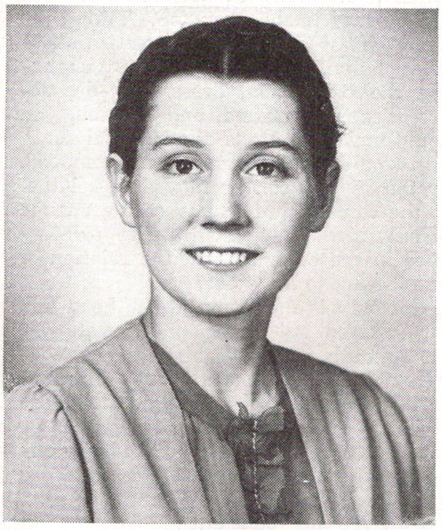
2 When the subject straightens up the camera gets an underview of the face, foreshortening the nose and whole face.



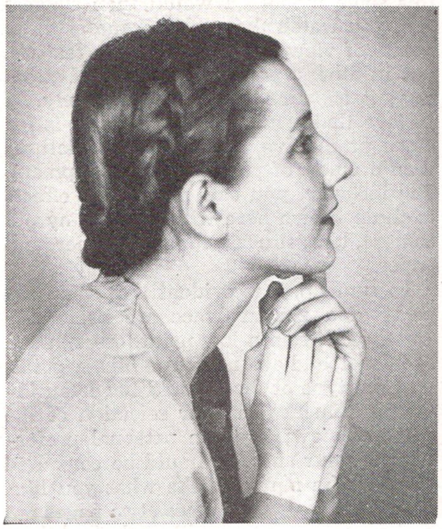
6 A profile is better drawn when the camera is directly opposite the face as was the case when this view was made.



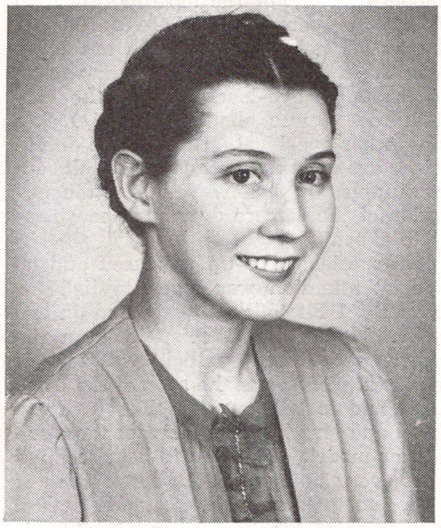
7 This view and that shown in No. 11 seem to be the least flattering of all though they are "standard" poses.



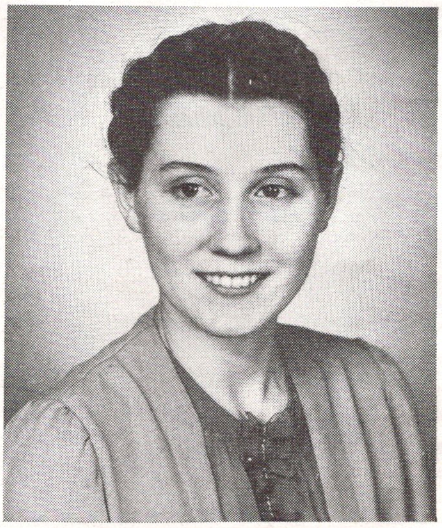
8 Straightforward views tend to flatten face and also show up any differences between the sides of the subject's face.



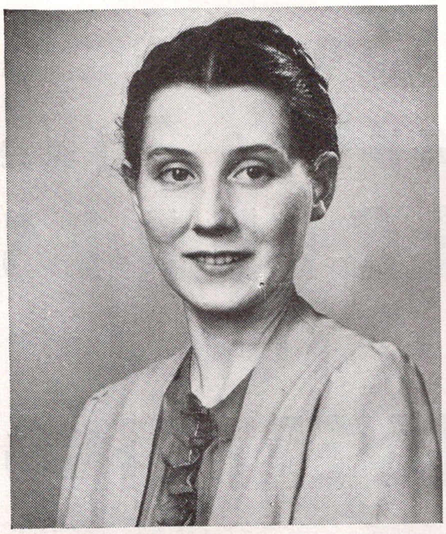
12 The inclination of the head here makes the ear appear too long and below the mouth. Compare with No. 6.



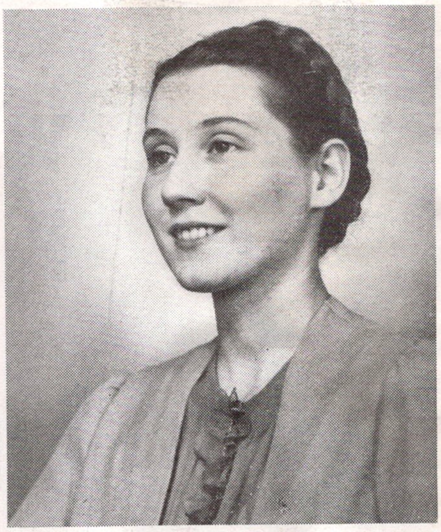
13 Compare this pose with those exhibited in No. 7 and No. 10. Though similar three-quarter views, this seems best.



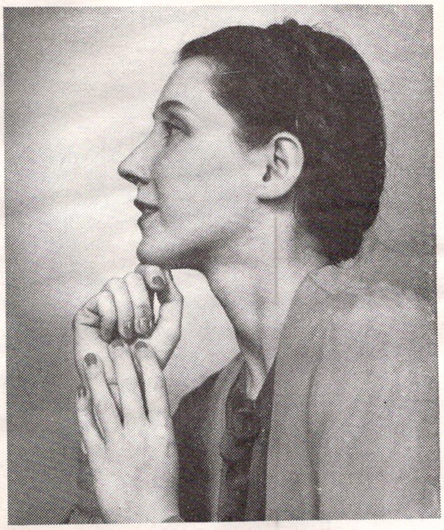
14 Almost the same pose as in No. 8 but a higher camera angle has made a big difference in general appearance.



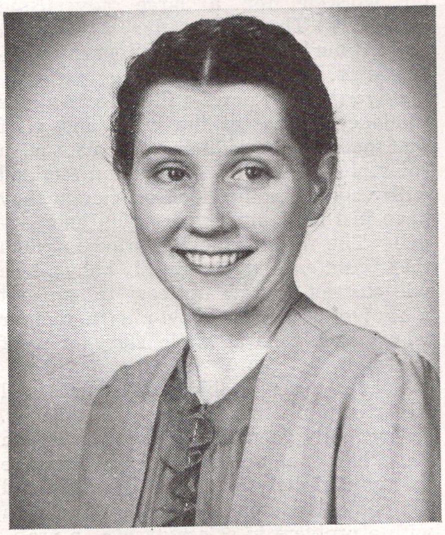
3 The slight inclination of the head and the low camera angle combine to elongate face and neck. Compare No. 9.



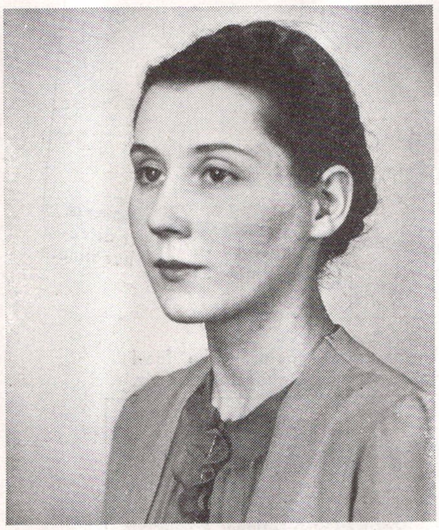
4 Compare with No. 10 below and notice the difference between the forehead, nostrils, and relation of eyes to ear.



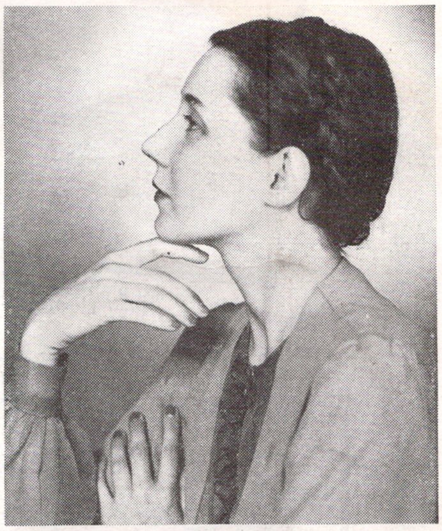
5 Profile from a low viewpoint shows underside of features. Compare this with portraits in Nos. 11, 17, 6, and 12.



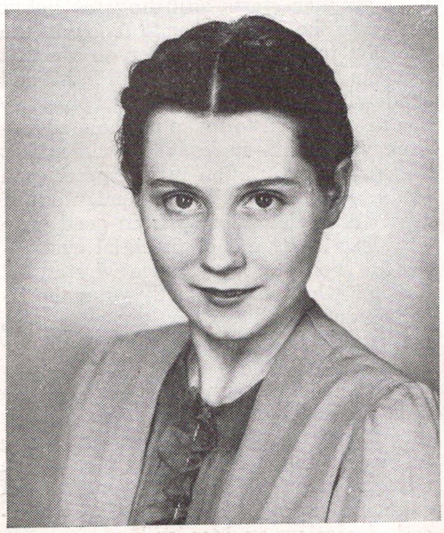
9 Similar position to No. 8 but with shoulders reversed and head and eyes turned slightly gives improved appearance.



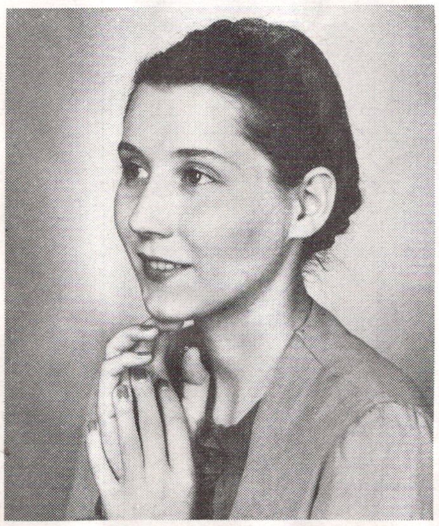
10 This pose is a conventional one that is used extensively in portraiture even though it shows little character.



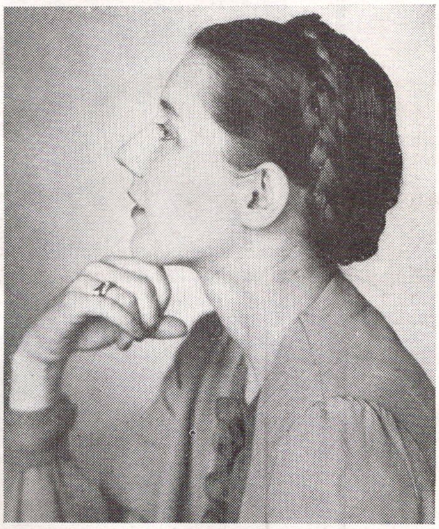
11 This view and that in No. 6 are much better than those in Nos. 5, 12, and 17. Inclusion of the hands is optional.



15 High camera position shortens the neck and alters the shape of head. Compare this portrait with Nos. 2 and 3.

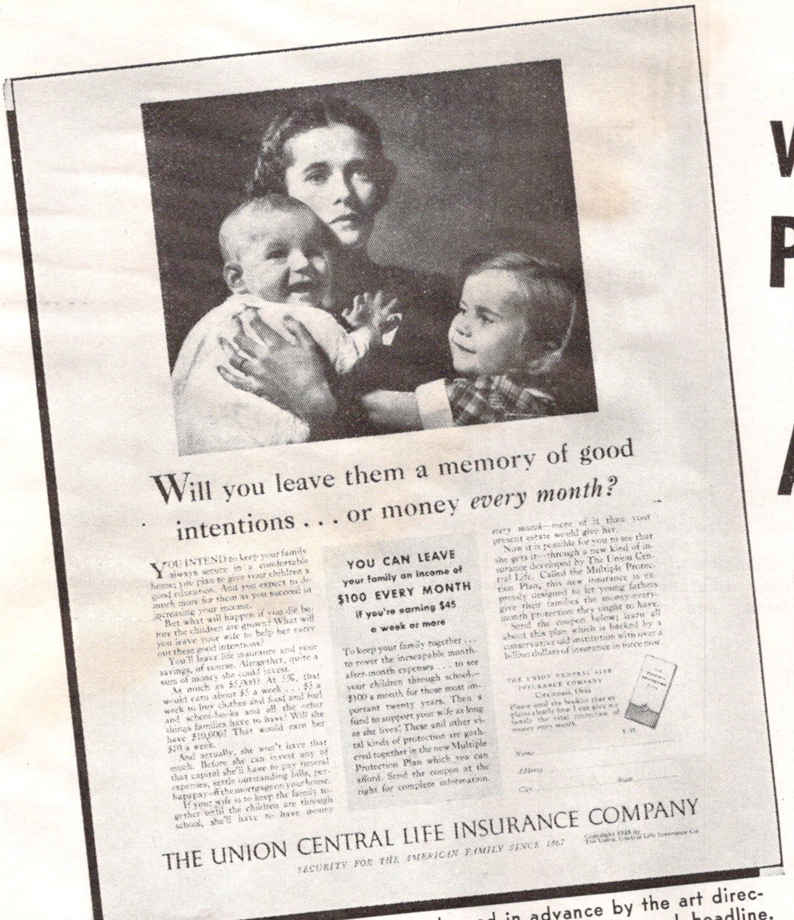


16 Note the difference of the shape of the cheek and neck compared with the three-quarter view illustrated in No. 4.



17 In this portrait the jaw is not as prominent as in No. 5 but the ear is much too low as also in portrait No. 12.

So You Want to Take PICTURES FOR ADVERTISING



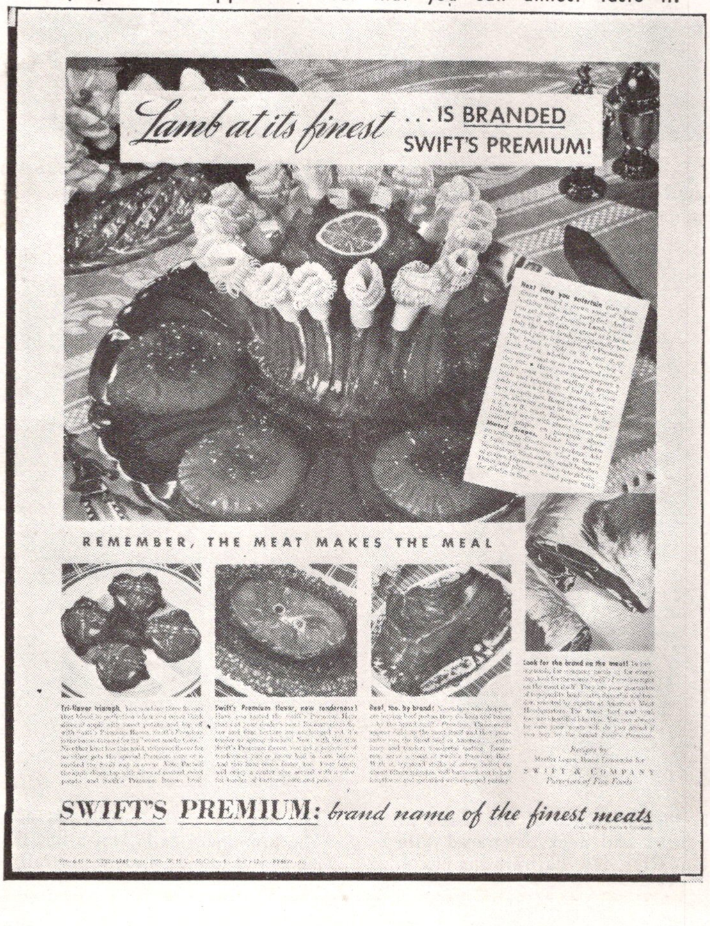
Will you leave them a memory of good intentions . . . or money *every month?*

YOU CAN LEAVE
your family an income of
$100 EVERY MONTH
if you're earning $45
a week or more

THE UNION CENTRAL LIFE INSURANCE COMPANY
SECURITY FOR THE AMERICAN FAMILY SINCE 1867

Advertising photographs are so planned in advance by the art director that they illustrate the selling idea in the copy and headline.

The original of this advertisement was in full color. The food displayed must appear so real that you can almost taste it.



Lamb at its finest . . . IS BRANDED SWIFT'S PREMIUM!

REMEMBER, THE MEAT MAKES THE MEAL

SWIFT'S PREMIUM: *brand name of the finest meats*

"WHAT are the tricks of producing a successful advertising photograph? Give us the inside dope on working for a large advertising agency." That was the assignment handed me by the editor of POPULAR PHOTOGRAPHY.

Anyone who knows a filter from a lens shade can guess at the work and grief that goes into producing, let us say, a color photograph of a juicy ham studded with vegetables that look as though they have just been plucked from a June garden. The fellow who has tried to catch that "cute expression" on his baby's face will suspect that it's not easy to turn out a shot of a happy baby plus a mother whose face tells a whole story of grief and courage.

Yet the basic problem of a successful advertising photograph is not so obvious. Every really good advertising illustration must help put across the sales message just as definitely as do the headline and the copy that appear with it. We begin with a problem in *salesmanship*—a problem which a great many people may have worked on before it ever gets to the photographer. Hours—yes, days—may have been spent on this problem before the photographer starts adjusting his lights. It's up to the art director to *interpret* the problem to the photographer, to see that he gets the right answer in light and shadow! The slightest photographic slip has been known to make a whole advertisement misfire—make it even ridiculous. The smallest variation in interpreting an idea may throw a whole campaign out of gear. A trivial sidestep from good taste may lose thousands of potential customers for a client. Do you see why an art director who knows exactly what the illustration must *say,* or must *suggest,* works side by side with the photographer?

Once again I cannot stress too much that successful shots are almost always thought out, worked out, step by step, to fit in with the central selling idea of the advertisement. It is not impossible, of course, that a photographer will, by himself, dream up an idea or happen on an accidental shot which will perfectly illustrate some advertiser's copy. It has happened and it will happen again, now

By CHARLES R. PRILIK

Art Director, J. Walter Thompson Company

Good advertising pictures are planned far in advance of the actual taking and must project life and realism into the copy.

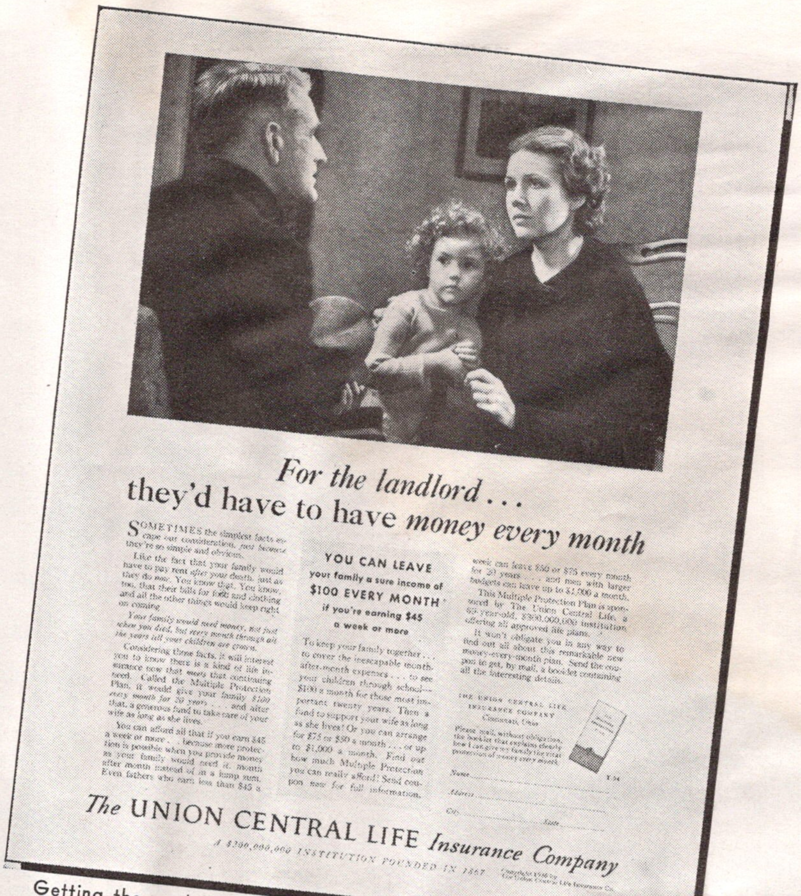
and then. But frankly, that is a miracle (one which art directors welcome when it happens, but consider almost too good to be true). The danger, you see, in using "freak" or accidental shots which were not worked out with the campaign is that they will be attention-getters which stop the reader by their punch or cleverness, but *do not lead him to the sales message!* In this group we may classify all the "strip-tease" photographs, the nude cuties advertising motor oil, furnaces, and piston rings. Add the dogs-in-doll-clothes and most of the babies advertising things babies never heard of, and you'll have a pretty fine collection of *unsuccessful* advertising photographs.

Yet one cannot safely make generalizations! One of the most successful advertising photographs in recent years was a symbolic shot which might have been used as an illustration on a number of different products. I speak of Torkel Korling's photograph of the baby's hand in the father's hand, a photograph which has won the two major awards at the annual exhibition of the New York Art Directors' Club, and prizes in every exhibition in which it has been entered. Here is the theme-idea type of shot which a photographer can dream up by himself and sell, if he's lucky enough to find the right account. It just happens that Mr. Korling had worked with me on this insurance account; we had discussed photographic possibilities many times. Mr. Korling had the theme of this particular campaign definitely in mind when he took the picture. His illustration was so near to the heart of our copy story that we were able to follow through for a number of months with a series of planned illustrations along the same line—proof in itself that Mr. Korling's photograph was "down the right alley" for our campaign.

But a lucky photographic strike happens only once in a blue moon. Week in and week out we must produce photographs that tell a story. We must have photographers who can take a story-problem and illustrate it dramatically—and do it in a hurry! Let us use Valentino Sarra's photographs for the same insurance account to illustrate how an advertising photograph grows from a selling idea.

Once the main selling idea is settled, the copywriters and the art director work together to create a "situation" for the picture. For instance, in the one with the headline—"Will you leave them a memory of good intentions—or *money*

(*Continued on page* 111)



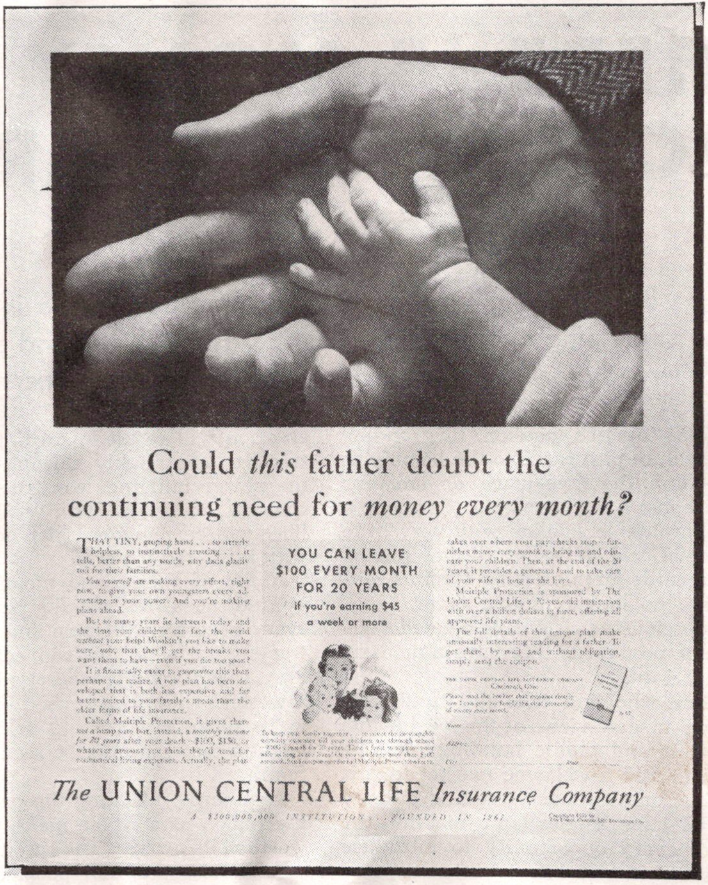
For the landlord . . .
they'd have to have *money every month*

YOU CAN LEAVE
your family a sure income of
$100 EVERY MONTH
if you're earning $45
a week or more

The UNION CENTRAL LIFE *Insurance Company*

Getting the models to react properly and assume the necessary expression is fully as important as is excellent camera technique.

Torkel Korling's now famous photograph of a father's and baby's hand was an exceptional shot taken without the actual copy in mind.



Could *this* father doubt the
continuing need for *money every month?*

YOU CAN LEAVE
$100 EVERY MONTH
FOR 20 YEARS
if you're earning $45
a week or more

The UNION CENTRAL LIFE *Insurance Company*

Careful choice of your subject matter has much to do with the sales value of your postcards. This scene literally breathes the "West."

This shot of a shepherd and his dog standing watch gives the real atmosphere of a sheep ranching territory.

THERE IS MONEY IN PICTURE POST CARDS

By ROSS MADDEN

Free-lance Photographer, Livingston, Montana

By exercising your imagination you can create interesting photographic post cards which will find a ready sale through drug stores and stationers.

Postcards that are different from the usual type have great appeal for tourists.

THE tourist's passion for sending picture post cards to the homefolks offers the free-lance or amateur photographer a chance to develop a steady, profitable sideline with very little trouble. Lurid views or dismal photographic cards, uninteresting even as records, are no longer finding favor. Picture-conscious tourists have created a demand for post cards that have a modern, pictorial slant.

Anyone who will take the trouble to make up-to-date views of the local points of interest and public buildings will be certain to find a welcome market for his efforts. Conscientiously seeking out the most effective angles and making the most of every opportunity to introduce variety and human interest into the presentation will result in cards that are attractive and readily saleable. Many of the newer buildings constructed of light colored materials with strong, simple lines will be shown to splendid advantage with infra-red materials.

A file of sunset and moonlight background negatives should be a part of every negative collection and will be extremely useful in this connection. However, care should be exercised to see that a western view of a sunset does not "put in its nickel's worth" to help out a silhouette that can only be seen by looking South.

Post cards reflecting the personality of the region as a whole make up a highly worthwhile group. The resources, industries, landscapes, and people, in fact all the various items that go to make up the particular character of the section, furnish possibilities. Clear, interesting, story-telling shots should be selected. The picture area must be so arranged that a strong center of interest is maintained and the only caption required is a brief title. While the cards in this group are primarily clear statements presenting some interesting facet of the region's personality, they must be on the pictorial side if they are to be well received.

Human interest and humorous material makes up another profitable group of cards. The subject matter, and not incidentally, the profits, will be limited only by your imagination and energy. Close-ups with general appeal, trick shots with

(Continued on page 104)

SOUND in your MOVIES

By LAWRENCE STESSIN

Dependable amateur equipment now is available to the movie fan who wants to dress up his films with sound. Various types are discussed and compared here.

EVER since the first professional "talkie" was flashed on the screen some twelve years ago, amateur movie makers have waited hopefully for the day when sound movies would become available in the 16 mm field. Some of them are still waiting, while others, not afraid of experimenting on their own, have produced results approaching those obtained in Hollywood.

It must be admitted that despite the success of the serious few, sound-equipped movies among non-professionals are still in the novelty class. To answer the obvious question "Why?", I interviewed a great many amateur movie enthusiasts. And it seems apparent that there are three types of amateurs who are, in part, responsible for the general lag in sound movies.

First there is the chap who started out with the impression that he could learn all there is to know about sound movies in three easy lessons. Having tried and failed he is quick in telling all who are willing to listen that "it can't be done."

The second kind of objector is the one who dislikes spending a few extra hours selecting his music, rehearsing the script, or preparing a suitable running commentary. As a result, his reels when viewed by an audience are accompanied by a hodge-podge of sound effects, having neither rhyme nor reason. After seeing such an exhibition can you blame the novice movie fan for steering clear of sound pictures?

And finally there's the case of the so-called "old-timer" who has had some experience with the sound equipment introduced 8 or 10 years ago and has since sworn off. In a way this individual cannot be blamed for cautioning the beginner against adopting sound movies. The early mechanisms were so delicate and difficult to handle that only people with some knowledge of engineering could ever hope to keep the machines in working order.

But times have changed. Today sound movies are available to every movie maker, provided he is willing to spend time and energy in turning out a workmanlike job.

Let's consider the various sound movie methods in vogue today. A popular procedure among amateurs is to employ the "sound-on-disc" system.

Essentially, sound-on-disc is a phonographic recording of dialogue, music, running commentary, or other sound effects, which sounds are to accompany your silent film when it is projected. The equipment needed includes a recorder, a microphone, a loud-speaker, aluminum or acetate discs, special grooving needles, and an ordinary phonograph.

The author superimposing comments while a record supplies the musical background.

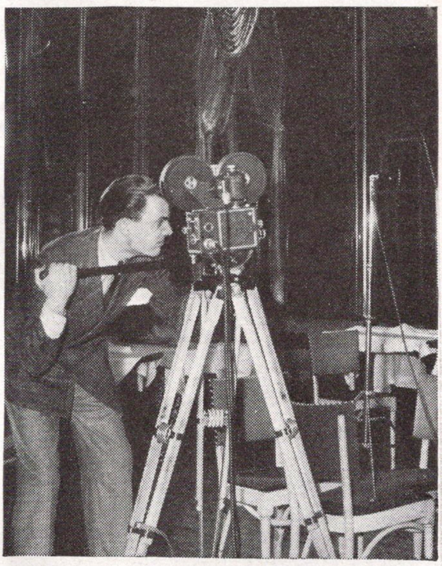
Actual lip synchronization is not readily accomplished by this sound-on-disc method. In fact, unless the recorder and the projector are coupled together, and the projector and the turn-table later to be used coupled in the same manner, good lip synchronization is impossible.

The most satisfactory use of sound-on-disc is to provide music or "off-stage" commentary which will accompany the screening of a film. A 12″ record, cut at the accepted standard of 112 lines per inch, will play for about 5 minutes per side when run at 78 revolutions per minute. Thus, one side of a 12″ record is about right for 100 feet of 16 mm film, which runs for about 4 minutes at 16 frames per second. At 24 frames per second the same amount of film will run for about 2⅔ minutes.

After the recording has been made, the disc can be played on any phonograph. When showing the film before an audi-

(Continued on page 109)

Watching the edited film as it is projected on a screen, two actors make a recording of their voices. The author (right) controls the volume. Projector and screen are not shown.


Single-system 16 mm sound equipment in operation. This is a Berndt-Maurer camera.

PICTURE ANALYSIS

By NICHOLAS HÁZ, F.R.P.S.
Teacher and Lecturer, New York City

When appraising the merit of a photograph, one must always consider the purpose for which it was made.

READERS of these analyses must be surprised to find, once in a while, that the allegations about the pictures don't seem to fit. The analyst is surprised, too, though perhaps not so much as the readers because he is more or less used to it.

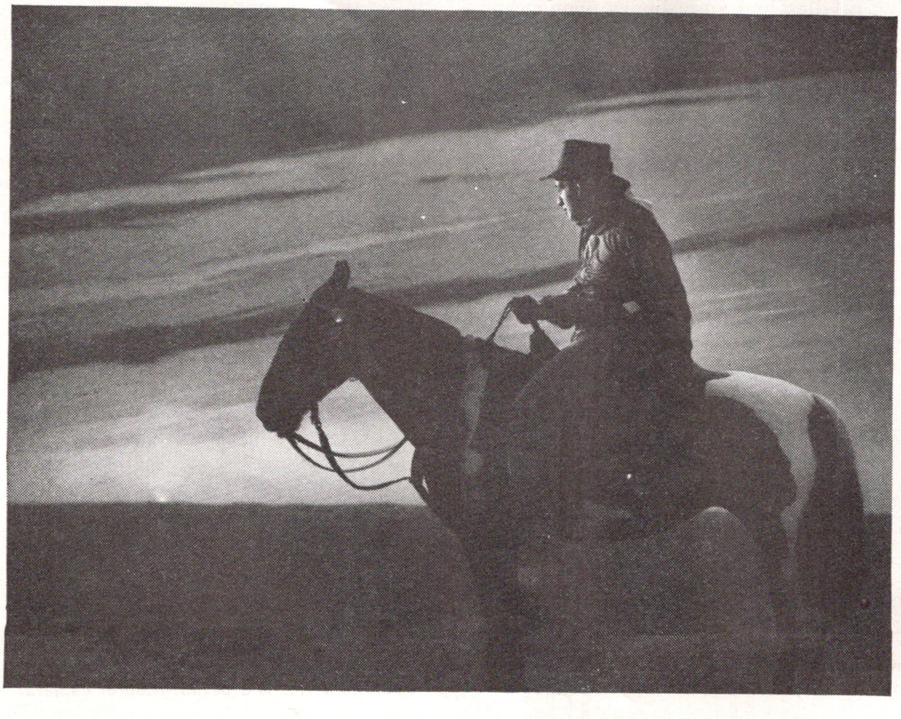
The cause of the contradiction is simple. The remarks are drawn from the original photographs but are printed with the half-tone reproductions. To make 300,000 small reproductions to represent perfectly a large photographic masterpiece is obviously impossible. The great reduction in size alone is enough to take a lot of kick out of the picture. Add the inevitable changes in the tone values and an almost different picture is made of the one which was criticized in the first place.

Then why not analyze the printer's proof of the half-tone? Because this would be unfair to the photographer who wants to be judged by his original work and not by a more or less altered reproduction. Therefore, if the reader wishes, occasionally, to participate in the funeral procession of the analyst, but *immediately,* let him remember the charity of the western saloon-keeper, whose poster, "Don't shoot the pianist, he is doing his best," has saved, probably, many a life.

When the writing of these analyses was assigned to me the editor said, "You can show, occassionally, a bad picture and tell why it is bad; but your job is, in the main, to show why a good picture is good." Now if quality and beauty were not relative to the observer, then this job would be easy. I would build up a little private Bureau of Standards for Pictures, equipped with suitable measuring instruments and with perfect models of good and bad pictures. The pictures then would be measured and checked against the models. Then I could hand down uncontradictable decisions which would stand up with all the critics and also in the courts. Soon I would be rich, because my chief clients would be the major producers of Hollywood, whom I could insure against flopping with their masterpieces.

I must admit with a measure of melancholy that I did not succeed to build such a Bureau, and never expect to. Every picture demands a new point of view, which often must be supplied by the maker of the picture. I mean the photographer has to tell me what he wanted to do, so I can tell him whether I think he has succeeded. When I select my own point of view it is always certain that large numbers of readers will assume other points of view from which I will be quite wrong. Nor can anything be done about it. This is the way of the world and will so remain.

GAUCHO by Lejaren à Hiller



Take, for instance, this picture, *The Gaucho* by Lejaren à Hiller. It would be hard to guess the right point of view from which this print should be appreciated. At first it seems to be a "pictorialist" job because its appeal is lyric and romantic and the picture resembles a painting or etching. But it also could pass as a puristic job (but for a slight dab that was air-brushed), because from the click of the shutter to the mounting and spotting no handwork was used on it. And the first requisite of a puristic picture is that it should be done purely by photography.

But the correct point of view of appreciation was given by Mr. Hiller, who said that this is an illustration to be used in an advertisement. A costumed model was posed on a hired horse in front of a huge expanse of linoleum on which a sunset was painted in pastels. The sun itself was represented by a 60-watt bulb, stuck near the edge of the linoleum. So this is an outdoor picture made indoors; a half painted picture done exclusively by photography. Just like the motion pictures are doing it.

Having been used with great success for its original purpose, it does not take a spark of genius to state that this is a masterpiece of its kind. But it is curious that it would stand up as a pictorial or as a purist picture, too.

This is not surprising because the maker, Lejaren à Hiller, is one of the best known masters in America. His name is historical, since he originated several "firsts" in the story of photography.

He was the first man to illustrate novels and advertisements with the camera, displacing many a brush, pencil, and pen. He is the one who has recreated many parts of the world in his studio, peopled with all types of characters, to tell the diverse stories demanded by art directors. This picture from Argentina was made in Manhattan, and in the same place they were doing Guatemala, Greece, and the North Pole at the same time.

Selling his first photographic illustration in 1902, Hiller's development is contemporaneous with that of the motion picture industry. He was an old hand at photography when Griffith began to fuss with his sets in Fourteenth Street. It is not generally known but Hiller has influenced the work of moving picture camera men to no small extent. He was the first one to take advantage of shadows for mood-making purposes, when all other movie directors flooded their pictures with light from all directions. Old time directors used to come to Hiller's sets and watch him work; the result of which studies would then show in their own pictures.

As to the composition of this print, it seems to be so excellent to me that it would be wasted work to take it apart to show how well it is put together. The subject matter is, of course, well selected; the number, size, and position of the im-

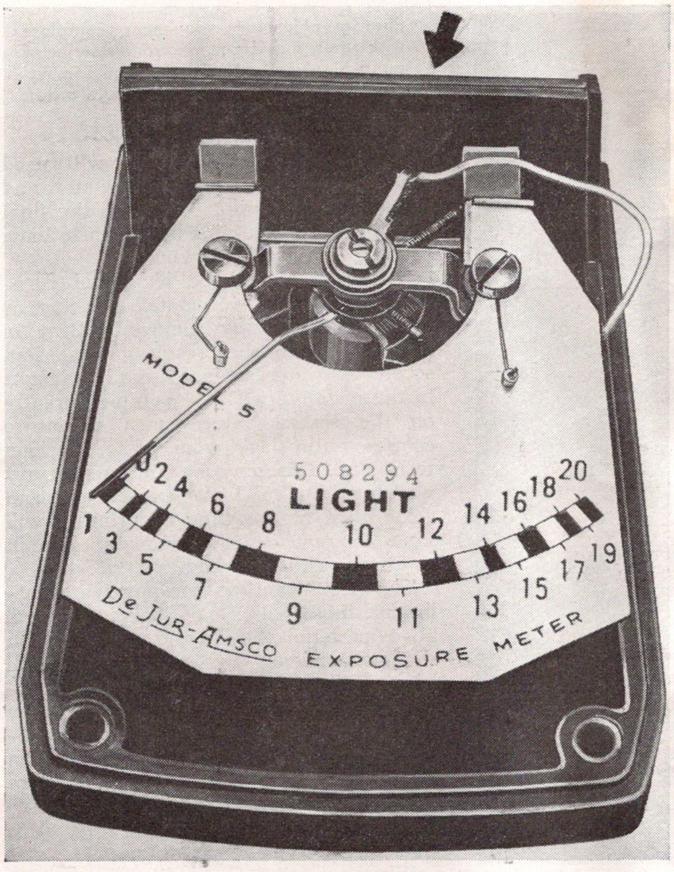
(*Continued on page* 107)

MEET YOUR METER

By THEODORE VON SABO

Technical Division, DeJur-Amsco Corporation

The faithful servant which gives you exposures "right on the head" is a precision instrument. Its principles of operation are explained here.



The light scale of a meter is seen here. Arrow indicates photoelectric cell, consisting of iron strip coated with light-sensitive chemical.

WITHOUT a doubt, one of the greatest aids to professional and amateur photographers alike has been the modern photoelectric exposure meter. Its appearance in the photographic field has definitely solved the problem of correct exposure, in the great majority of cases.

This last statement hinges upon the knowledge one possesses relative to proper use of the meter. Like any other scientific instrument, the photoelectric exposure meter requires a certain amount of investigation if the individual is to derive the utmost benefit from its use. In gaining a working knowledge of the device, no better foundation can be had than to obtain an understanding of the underlying principles upon which it is built and on which it operates.

The average amateur photographer is constantly prying into the innermost recesses of his gadgets. Nothing gives him greater delight than to take a screwdriver in hand and start taking things apart to see "what makes them tick." This procedure can lead to disastrous results, especially if one attempts to dismantle a precision instrument like the exposure meter. In order that the reader may understand the photoelectric meter thoroughly without risking any costly consequences, this article will attempt to explain a meter's parts and their functions.

Avoiding the scientific discussion which is apt to overload a story of this type, we first come to the conclusion that the photoelectric exposure meter is really nothing more than an instrument which changes light energy into an electric current which in turn is measured and given definite values. To accomplish this task, two devices are necessary, namely, a substance which is electrically sensitive to light and a mechanism which acts as a measuring medium.

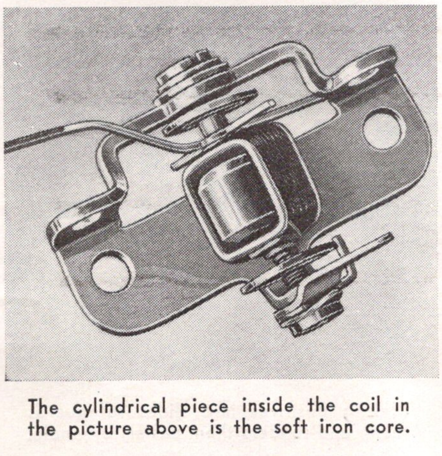
The first device, called a photoelectric cell, consists of a thin strip of iron coated on one side with a chemical substance sensitive to light. The chemical most commonly used is selenium, an element similar to sulfur. This material is found to contain an excess amount of negative particles of electricity called "electrons."

Those of you who have had a course in high school physics remember the definition of an electric current: a stream of electrons passing through a conductor. Thus, when light is incident upon the selenium surface, it theoretically drives the electrons out into an external circuit, thereby giving rise to an electric current. As the intensity of the light increases, a greater number of electrons are caused to move from the selenium layer to the external circuit, thereby increasing the strength of the electric current.

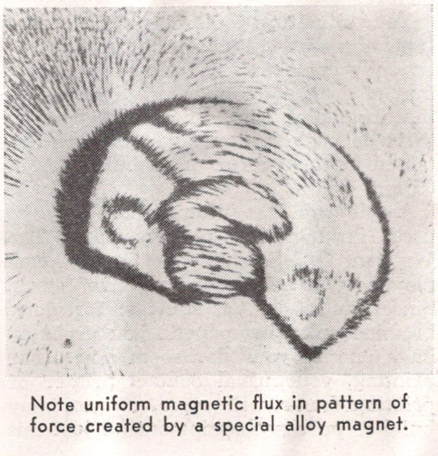
The meter must now convert this flow of electricity into definite units or values. To measure the electronic flow, the exposure meter contains a second device, known to physics students as a galvanometer. This ingenious instrument consists of a magnet and a movable coil.

Among the many properties of a magnet, three are worthy of consideration in this case. First, a magnet has two poles, which are sometimes arbitrarily termed a north pole and a south pole. Second, like poles repel each other while unlike poles attract each other. Thus, if two magnets are placed in close proximity with each other, and the north pole of one is facing the north pole of the other, the magnets will repel each

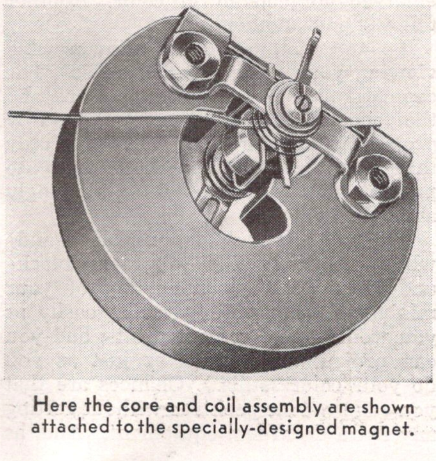
(*Continued on page 117*)



The cylindrical piece inside the coil in the picture above is the soft iron core.



Note uniform magnetic flux in pattern of force created by a special alloy magnet.



Here the core and coil assembly are shown attached to the specially-designed magnet.

Photographic story sequences, complete with titles, may be made from a series of good black-and-white slides. A filing system, as shown, helps keep them in order.

PROJECT YOUR FAVORITE BLACK-AND-WHITE SHOTS

If you have a projector for color, you'll find it useful for showing slides made from your negatives. They're easy to prepare. Follow the process as described here.

A CLICK of your projector switch, and one of your pet color "stills" flashes on the screen, enormously enlarged, gorgeous in full color. Another follows, and another . . .

It's an ideal method of showing and viewing your color transparencies. The dramatic size of the screen picture and the concentration of interest obtained by projection in a darkened room with only the screen illuminated both help to present your full-color shots strikingly and effectively.

Why not try it with your black-and-white pictures? You can make black-and-white positives, from any of your miniature camera negatives as easily as you would make contact prints; and you can project these positives just as you do your color "stills." Chances are that you can produce positives without getting any extra darkroom equipment. And, as you'll soon discover, the richness and tonal scale in a well made film positive can do much to redeem even a mediocre picture.

Your miniature camera produces negatives of a size suitable for making positives by contact. The process is simply that of ordinary contact printing, except that instead of using sensitized paper you print on positive film. This may be obtained in sheet form, or in bulk rolls of 35 mm width.

Ample safelight illumination may be used in handling positive film. The Wratten OA Safelight is usually employed with Eastman positive stock. Since this safelight is standard for many bromide enlarging papers, you probably have one in your darkroom now. For printing, your usual contact printer or printing frame will serve, or you may build or purchase equipment for just this purpose. Other things you will need are trays for developer, rinse water, and fixing bath; running water for the final washing; and film clips by which to hang the film while it is drying.

Negatives should be examined carefully before they are printed, any dust or dirt being carefully removed. Bear in mind that blemishes resulting from lint, scratches, water spots, or similar defects in the negative will be magnified greatly on the screen. Since most miniature camera enthusiasts take pride in clean technique, this may be an unnecessary warning; but a little extra care and cleanliness at the time of printing will save a great deal of delicate, difficult spotting on the finished positive.

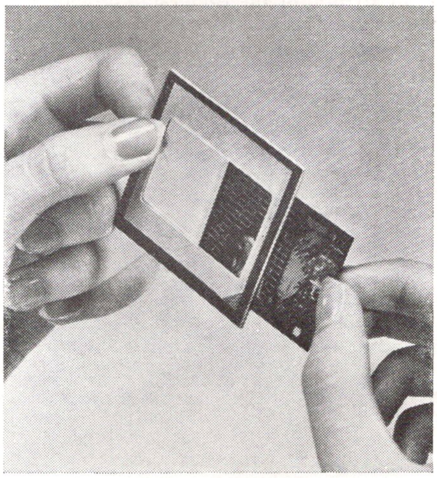
The best negatives for positive printing are those with clear, sharply-defined, all-over detail both in the highlight and shadow portions. Subjects having a full tonal scale are usually preferable. Extreme low key shots may look dull on the screen, and high key pictures may allow so much overall light to reach the screen that glare will result. But there are exceptions, so that it's a sound rule to print a positive from any negative that seems to have possibilities.

When a strip of negatives has about the same density and contrast throughout, it can be printed on a single length of positive stock. This saves time in development, as the strip takes no longer to develop than an individual frame. Tray development, with inspection by safelight, is advisable, so keep the strips short enough to handle conveniently. A light-tight printing box is convenient for printing strips of several frames.

In printing, take care to maintain good contact between the negative and positive films. Poor contact, which often occurs when makeshift printing devices are used, results in loss of definition; and this is magnified on the screen.

Negative emulsion is placed in contact with positive emulsion, just as in regular

(Continued on page 96)

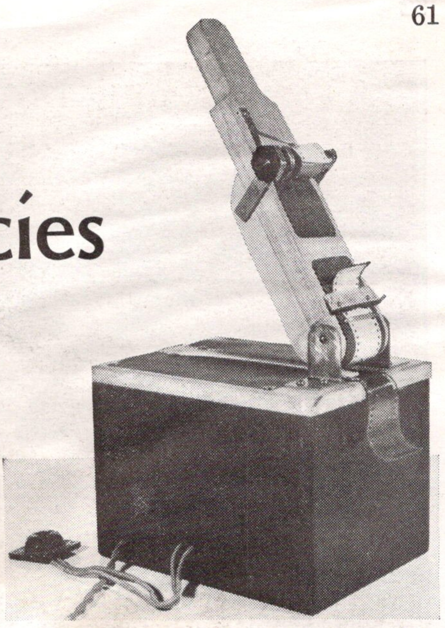


Making positives into slides safeguards them, and renders them easier to handle.

An Efficient Printer For Positive Transparencies

By HENRY J. KARL
Amateur Photographer, Florence, Mass.

This inexpensive and easily-built contact printer enables you to make transparencies from your prize negatives



Ready for use, the printer looks like this.

THE pleasure derived from a miniature camera can be greatly increased by making prints on safety positive film and projecting them on a screen. Most good projectors now available will handle both slides and rolls of either double or single-frame prints made on 35 mm film.

The positive film printer described here can be built at a moderate cost and is essentially the same as one used for making contact prints on paper. It can be used to make positive prints from either single or double-frame 35 mm negatives on standard 35 mm safety positive film for projection, printing one frame at a time. If desired, a similarly-dimensioned section may also be printed from a single larger negative up to and including a 4 x 5 without cutting down the original size of the negative.

The positive film can be moved ahead one frame at a time and is held rigidly in a frame on the platen, which is raised to permit movement of the negative over the printing aperture. Poor frames thus may be omitted, the sequence of frames varied, and negative rolls changed easily. A 10-watt ruby light inside the printing box provides ample illumination for moving or changing negatives and judging the printing time. (Most positive film may be handled under a safelight. This point is dealt with later.) When the negative is in position the platen is lowered, placing the positive film in contact with the negative to make the print.

Construction of the printer begins with a visit to the five and dime store for the purpose of purchasing two toy film-viewing devices to obtain the film sprockets with which they are equipped. Be sure to get the type having a sixteen-tooth sprocket, as there is another kind using a much smaller sprocket wheel. Break

(*Continued on page 97*)

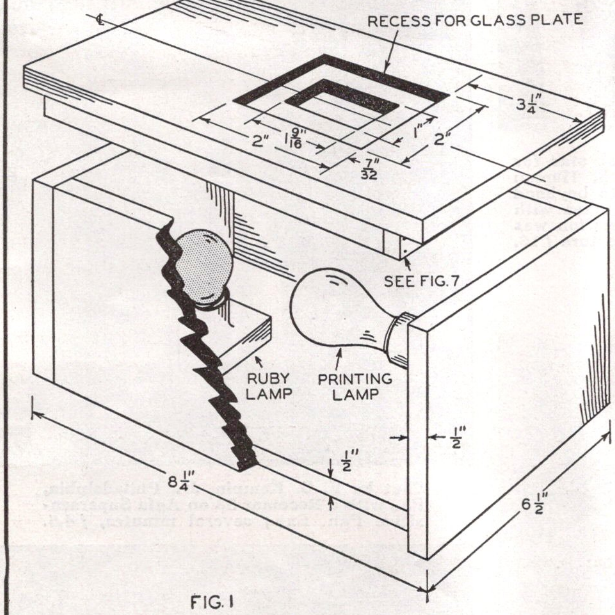

RECESS FOR GLASS PLATE
2"
1 9/16"
1"
2"
7/32
3 1/4"
SEE FIG.7
5 1/4"
RUBY LAMP
PRINTING LAMP
1/2"
1/2"
8 1/4"
6 1/2"

FIG. 1

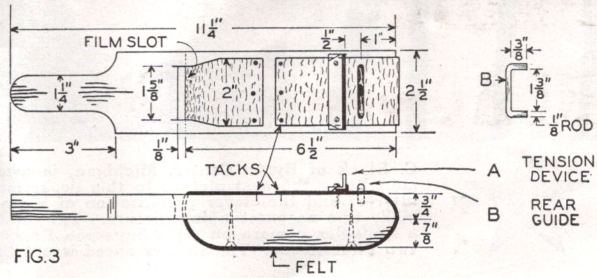

11 1/4"
FILM SLOT
1/2"
1"
1 1/4"
1 5/8"
2"
2 1/2"
3/8"
B
1 3/8"
1/8" ROD
3"
1/8"
6 1/2"
TACKS
A
TENSION DEVICE
B
REAR GUIDE
3/4"
7/8"
FELT

FIG. 3

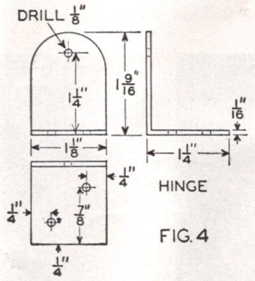

DRILL 1/8"
1 1/4"
1 9/16"
1/16"
1 1/8"
1 1/4"
1/4"
HINGE
1/4"
7/8"
1/4"

FIG. 4

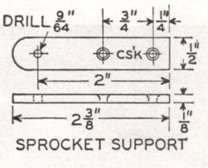
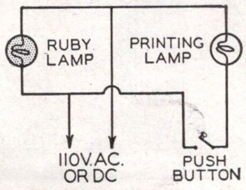

DRILL 9/64"
3/4"
1/4"
CSK
1/2"
2"
2 3/8"
1/8"
SPROCKET SUPPORT

FIG. 5

FIG. 2
WIRING DIAGRAM


RUBY LAMP
PRINTING LAMP
110V. A.C. OR DC
PUSH BUTTON

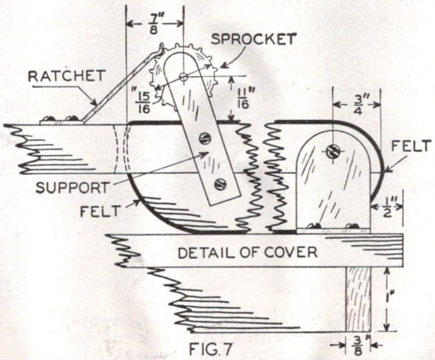

7/8"
SPROCKET
RATCHET
15/16"
11/16"
3/4"
FELT
SUPPORT
FELT
1/2"
DETAIL OF COVER
1"
3/8"

FIG. 7

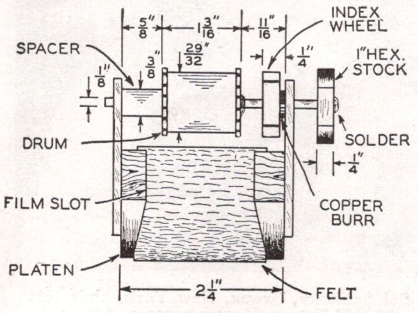
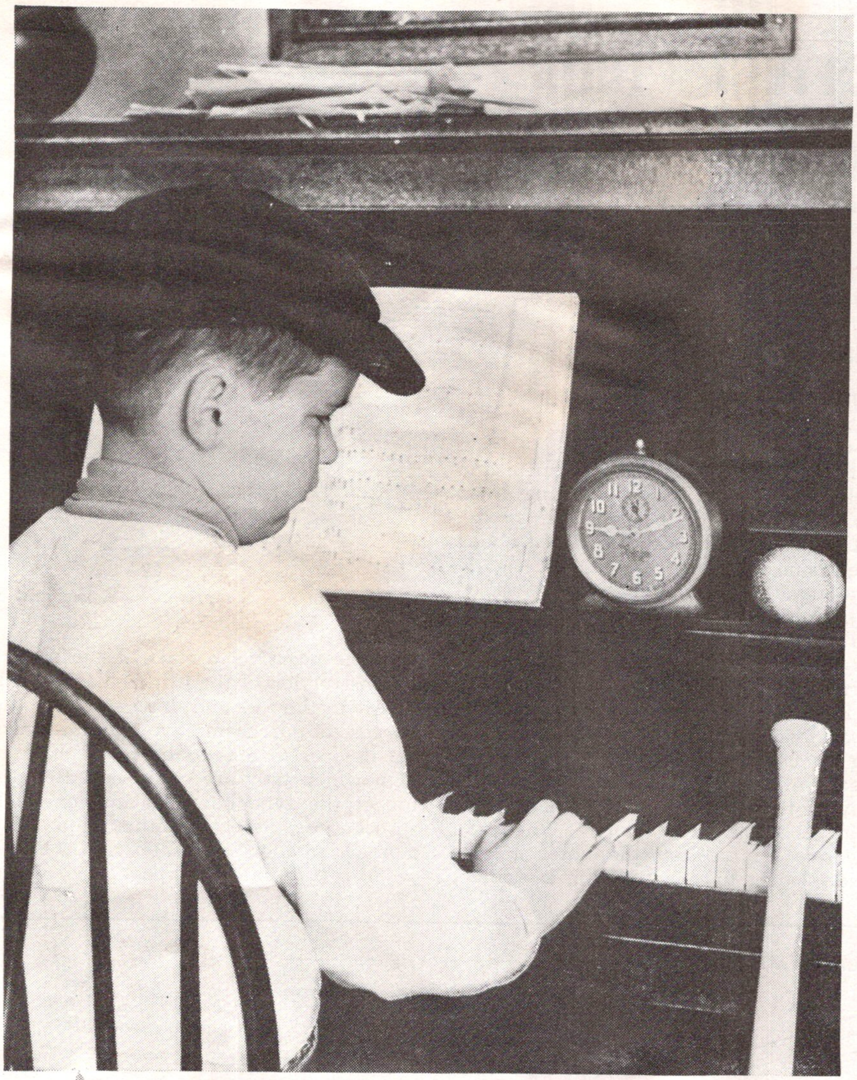

INDEX WHEEL
5/8"
1 3/16"
11/16"
SPACER
29/32"
3/8"
1/4"
1" HEX. STOCK
1/8"
DRUM
SOLDER
1/4"
FILM SLOT
COPPER BURR
PLATEN
2 1/4"
FELT

FIG. 6

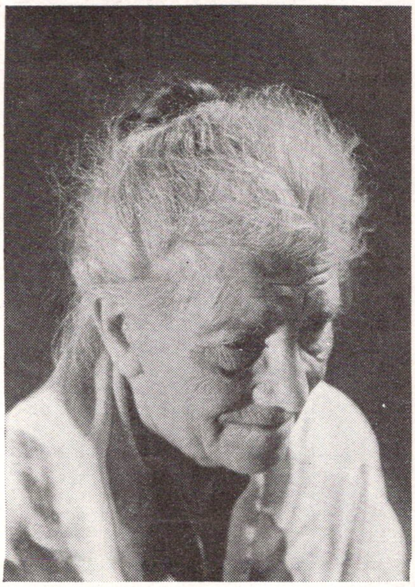


C. Black of Byron Center, Michigan, is awarded the first star for submitting the best picture to this department this month. Human interest and the clever presentation of a story common to boyhood make this an outstanding picture. The photograph was taken with a Rolleiflex camera on Agfa Superpan Press film. Illumination was two Photofloods. The shutter speed was 1/50 second; aperture ƒ 16.

Taken with a 4x5 Graflex by D. D. Logan, Clarinda, Iowa, on Super-Panchro Press with K-2 filter. Exp., 1/250 sec., ƒ 8.

Lorne C. Elder, Montreal, Canada, used a Welta Garant camera and Selo Hypersensitive Panchromatic film; 1/200 sec., ƒ 3.8.

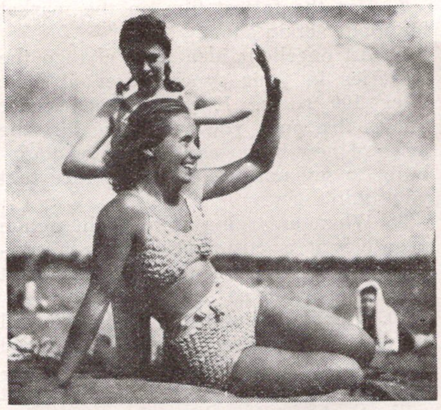
Shot by F. G. Kempin, Jr., Philadelphia, Pa., with a Recomar 33 on Agfa Supersensitive Pan. Exp., several minutes, ƒ 4.5.



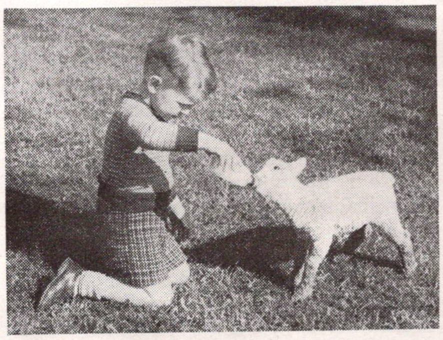
Sol Schilsky, Bronx, New York, shot this with a 6.5x9 cm Kawee camera, 1/10 sec., ƒ6.3. Panatomic-X, two No. 2 Photofloods.

"Toughy," by W. Winston Thomas, Bogotá, Colombia. Taken with a 1A Kodak on Panatomic film. Exposure 1/50 sec. at ƒ 11.

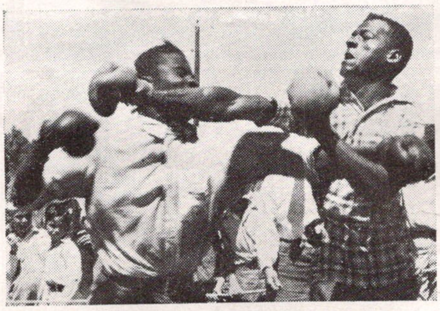
Photo by William Herries, New York City. Made with Zeiss Nettar camera on Kodak Super-XX film. Exposure 1/60 sec., ƒ 8.



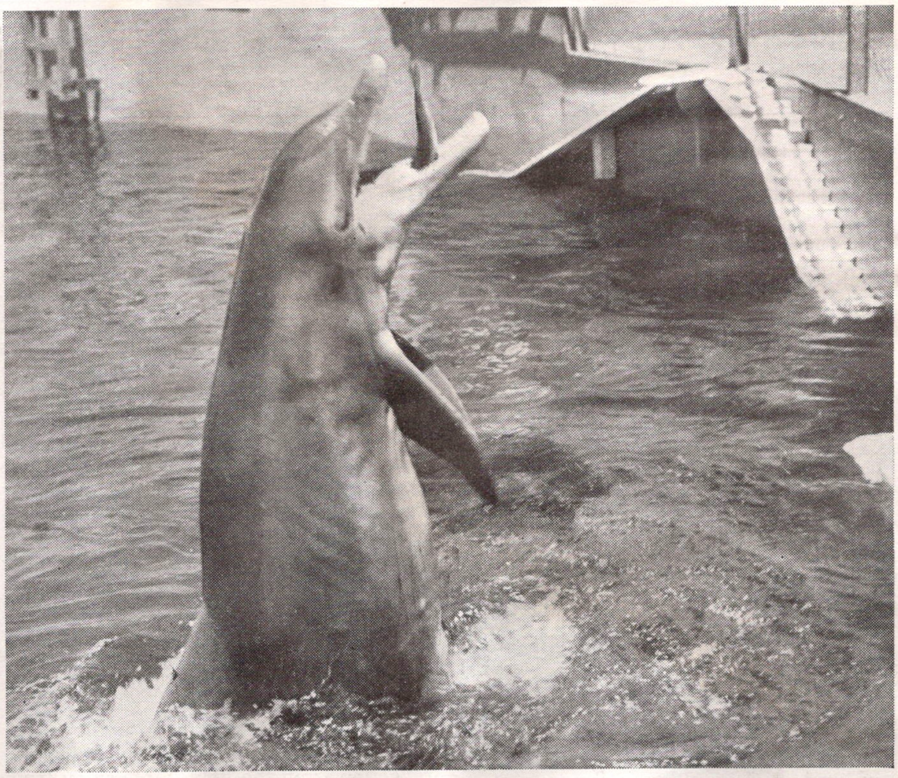
Snapped by "JEV," Minneapolis, Minn., on Perutz Pergrano film with a Rolleiflex at 1/100 sec., ƒ 3.5; med. yellow filter.



An Argus camera was used by G. Stokes of Brantford, Ont., Canada. Exposure 1/100 sec., ƒ 8 on Agfa Superpan Supreme.



Elbert Shea, Bonham, Texas, snapped this at 1/250 second, ƒ 25, with a 6 x 9 cm. Ihagee on Eastman Super-XX filmpack.



2

The second best picture submitted this month is this unusual shot by T. H. Veal, Waycross, Ga. The picture was made in the Marineland Studio, Orlando, Fla., while the porpoise was being fed. Mr. Veal used a Speed Graphic and Agfa Superpan Press film. The exposure in sunlight was 1/500 second and the aperture was ƒ 11. This is a splendid example of alert, stop-action photography.

PICTURES FROM OUR READERS

Shot with a Leica F on Agfa Ultra-Speed Pan film by Dick Neidhardt, Chattanooga, Tenn. Exposure was 1/40 second at ƒ 6.3.

Dr. Pablo Loew, Buenos Aires, Argentina, took this with a Retina II on Selo H.P. film, med. yellow filter, 1/50 sec., ƒ 2.8.

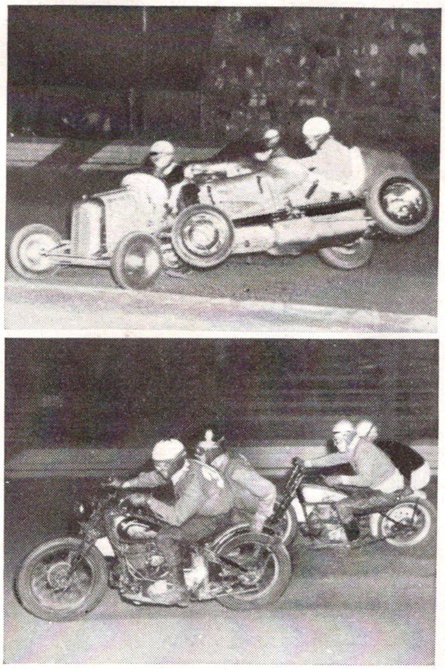
"Calico," by B. G. Douglass, Mt. McKinley, Alaska. Made with Kodak Six-20 on Verichrome film. Exposure, 1/50 sec., ƒ 32.

Night Action Photos Are a Cinch

by Don Downie

HOW often have you gone to your favorite sport in the evening, whether it be football, baseball, basketball, racing, or a horse show, and wished that you could photograph the events as they occurred?

Night action photos are a cinch to shoot and the additional expense of supplies is not prohibitive so long as the photographer makes his shots count. Reliable synchronizers can now be purchased at a reasonable cost and can be fitted to the shutter of any average camera. With the addition of this one "gadget" and some flashbulbs the snapshot artist is ready to embark upon an entirely new and fascinating field of photography. There are, however, a few items which must be kept in mind.



These night racing shots by the author were taken "broadside," as recommended.

1. A Photoflash bulb is not very effective for more than 40 or 50 feet when synchronized at high shutter speeds. To obtain a good shot the photographer should stay well within the limit of his flash. If the camera is in near-perfect synchronization it is advisable to stay at least 25 feet away from the action so that the finished print will not show movement. The farther away a camera is from the action, the more slowly it may be shot and still "freeze" movement.

2. In shooting pictures close to moving objects, shutter speeds of 1/200th second will not stop action (other than head-on shots) unless the photographer "pans" his camera with the movement: i.e., follows his object in the finder during the time of exposure.

3. *Whenever possible, silhouette your* object against a wall or some other reflecting surface. The lack of a background is the one factor that makes night football photos so difficult to shoot. The flash is lost in the space of the field and only light helmets and numerals show up on the film.

4. When you are photographing sports contests at night, be careful that your flash does not blind the eyes of your subject. Never shoot pass or kick plays on a football field if you wish to remain on the sidelines. Coaches are very touchy on the subject. Never flash your bulb directly into the faces of motorcycle and midget car drivers—wait until they are broadside to you—for your flash may momentarily blind a driver and cause a serious accident.

5. If your flash reflector becomes bent or battered, don't buy another one. Many photographers have purposely hammered rough bumps in their reflectors to give a more even lighting and eliminate the "hot spot" usually found in the middle of flash shots.

6. For more sparkle in your night shots use a lens shade, to keep the reflection from the field lights away from your lens.

7. Use the fastest film on the market for night action shots.

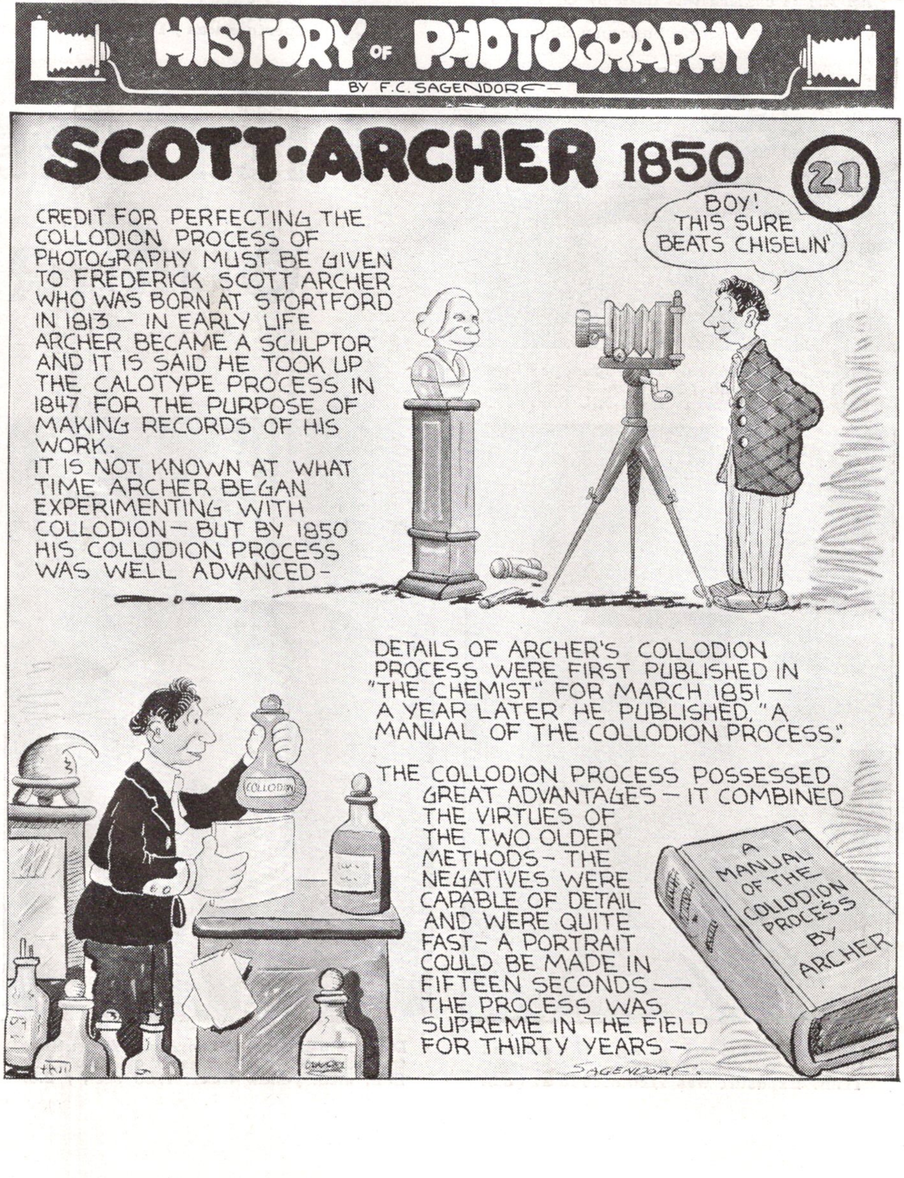
8. An excellent idea is to change the batteries in your synchronizer at least after 100 shots. If your synchronizer misses fire once you will have lost the price of new batteries in a wasted flashbulb, to say nothing of the picture that you didn't get.

9. When enlarging from night action negatives it is customary to use a contrast paper to give the finished print snap and brilliance.

10. The foreground of a flash shot will print a blank white unless it is dodged in enlarging. By darkening the foreground, the central object in the print will stand out in white, thus centering interest.—

How to Tell Whether Your Compur Is Open or Closed

BECAUSE the release lever returns to the starting point when setting the Compur shutter to "time," one never can tell from the position of the release lever whether the shutter is open or closed. This leads to double exposure and even no exposure at times. If a spot of white lacquer is placed on the outermost leaf of the shutter, the spot is visible when the shutter is closed.—*George E. Woods, Mechanicsburg, Pa.*


HISTORY OF PHOTOGRAPHY
BY F.C. SAGENDORF—
SCOTT·ARCHER 1850
21
CREDIT FOR PERFECTING THE COLLODION PROCESS OF PHOTOGRAPHY MUST BE GIVEN TO FREDERICK SCOTT ARCHER WHO WAS BORN AT STORTFORD IN 1813— IN EARLY LIFE ARCHER BECAME A SCULPTOR AND IT IS SAID HE TOOK UP THE CALOTYPE PROCESS IN 1847 FOR THE PURPOSE OF MAKING RECORDS OF HIS WORK.
IT IS NOT KNOWN AT WHAT TIME ARCHER BEGAN EXPERIMENTING WITH COLLODION— BUT BY 1850 HIS COLLODION PROCESS WAS WELL ADVANCED—
BOY! THIS SURE BEATS CHISELIN'
DETAILS OF ARCHER'S COLLODION PROCESS WERE FIRST PUBLISHED IN "THE CHEMIST" FOR MARCH 1851— A YEAR LATER HE PUBLISHED, "A MANUAL OF THE COLLODION PROCESS."
THE COLLODION PROCESS POSSESSED GREAT ADVANTAGES— IT COMBINED THE VIRTUES OF THE TWO OLDER METHODS— THE NEGATIVES WERE CAPABLE OF DETAIL AND WERE QUITE FAST— A PORTRAIT COULD BE MADE IN FIFTEEN SECONDS—— THE PROCESS WAS SUPREME IN THE FIELD FOR THIRTY YEARS—
COLLODION
A MANUAL OF THE COLLODION PROCESS BY ARCHER
SAGENDORF.

Print Criticisms

The service rendered on this page is free to our readers. Send your prints with technical data to POPULAR PHOTOGRAPHY, 608 S. Dearborn St., Chicago, Ill. We regret that we cannot criticize prints by mail, nor can we return prints submitted to this department.

G. W. G., Carbondale, Pa.—While the lighting and exposure in this shot are adequate, the composition and atmosphere could have been improved upon considerably. Subjects like this should more nearly fill the picture area. The rather long expanse of lace table-cloth between the subjects and the camera adds very little to the shot, nor does the figured wallpaper help. Since the objects were so obviously "set up" there was no point in having the glasses partially filled with some colored liquid. Of course you wanted them to show up clearly; but this should have been accomplished by means of lighting and background. It would have been all right to show the glasses filled had they been part of a regular table setting (either before or after a meal). As it is, you have a somewhat meaningless picture of china and glassware. It is neither a commercial type of shot, showing the subjects clearly and brilliantly, nor a well-composed still life. You probably would have had better luck using less subject material. Try this sort of thing again, making your print tell some kind of story, or shooting for the maximum amount of texture in the glass and china.

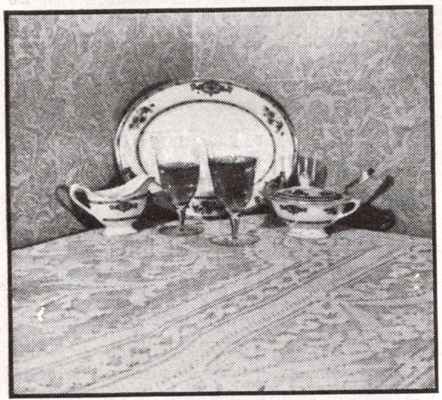
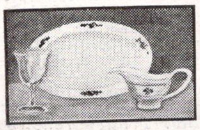


Photo by G. W. G.



Left: Sketch shows better placing and setting for subject.

* * *

A. D. R., Premier, B. C., Canada.—For having used only daylight coming in through a window, you obtained very good lighting in this picture of a baby. A simple reflector would have filled in the shadows on the side of the face away from the window to some extent. This would have tended to produce the "flat" or soft, equalized lighting which is usually best for pictures of children. Some facial modeling is necessary, of course; but in the case of young babies especially, the fewer the harsh shadows the better. You did well to use a portrait attachment, thus filling your negative with the important material; and the sharp detail in the face indicates that you must have watched your focusing pretty carefully. The main trouble here is that you did not make sufficient allowance for parallax. As a result, the field of view of your lens was not exactly the same as that included in your viewfinder. This condition arose from the comparative proximity of the camera to the subject. Hence the top border of the picture cuts across the subject's head, detracting considerably from what otherwise might have been a good shot of a young baby. The exposure was a good one, and the print quality is acceptable.

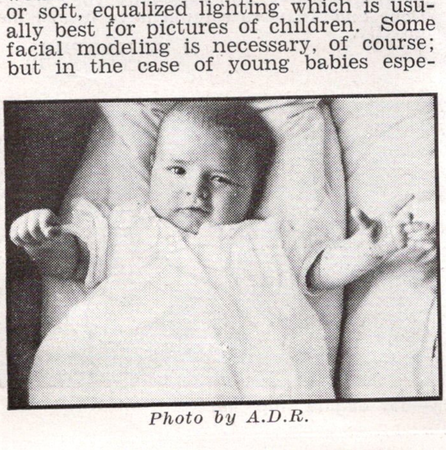


Photo by A.D.R.

* * *

H. R. O., Minneapolis, Minn.—The most apparent fault in this picture is the considerable amount of blur. This almost certainly arose from your failure to hold the camera steady as you snapped the shutter. The importance of using a tripod cannot be overstressed, especially when you are shooting at 1/25 second or slower. Some people can hold a camera steady at very slow shutter speeds, but this takes practice and should be avoided wherever possible. If you had no tripod you might have braced the camera against a window-frame, a building, a lamp-post, or some similar firm support. The exposure here seems to have been about right, although the "bald" sky indicates that a filter would have helped considerably. Regarding your choice of subject matter, we can see little of real interest. An unblurred picture of the scene might have shown some interesting detail. It would appear that there is too much in the view you chose, which makes for confusion.

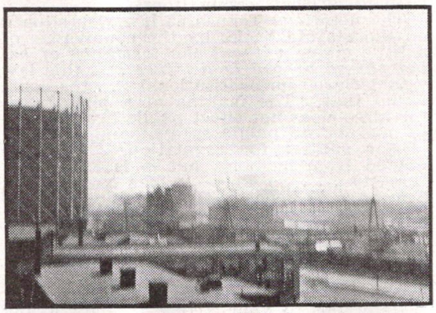


Photo by H.R.O.

* * *

M. L. L., Upland, Calif.—Afternoon sunlight can be very effective in photography, and you are to be commended for having employed it in taking this picture. Many critics would object to the fact that the dress is in a much higher key than the face. Generally speaking, the face should contain the lightest tone in a portrait, thereby attracting the attention immediately. In this case the side or backlighting is very nice, but it would have been much better if used in conjunction with a reflector. A piece of cardboard, or a sheet draped over a chair in front of the subject would have reflected the sunlight back into the subject's face, thereby giving the eyes some sparkle and lightening up the features considerably. The intense light on the white dress then would not have been so distracting, although it might still be printed in locally to give a better effect. We have cropped a considerable amount from the bottom of your original print, and a little from the top. This indicates that you might have stood closer to the subject. And we would like to see more print area at the left and less at the right. The dark background served nicely in this case, and the print quality is good.

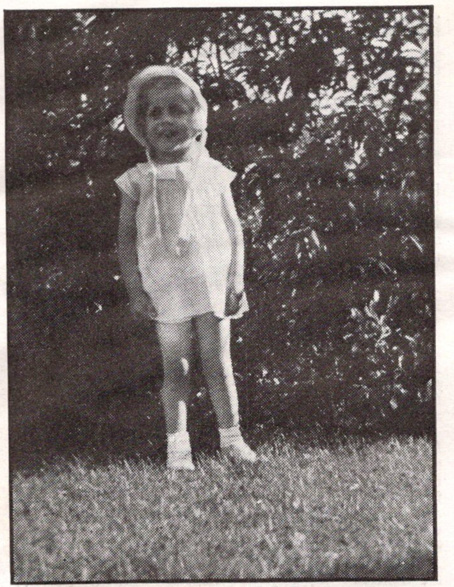


Photo by M.L.L.

* * *

R. T., South Haven, Mich.—Without seeing your negative we must assume that the reason this print is so gray and lacking in contrast is that the original shot was under-timed. A filter would have helped to bring out the line of division between water and sky along the horizon at the left of the picture. And, as you suggest, it would have been better to remove the tin can from on top of the piling nearest the camera before you shot. A lower camera angle might have been better here, since it could have produced a less monotonous composition. Regarding the composition itself, there were several other possible uses of the subject matter which would have been better. As it is, the row of pilings leads the eye toward the right and straight out of the picture. You should usually try to keep the attention within the boundaries of a print, locating the main point of interest somewhere above or below and to one side of the center of the print. By printing this negative so as to obtain more contrast you can improve the print quality; but it is difficult to see how you can do much with it compositionally, even by cropping it. Without knowing more about the locale in which you found this row of pilings, we are limited in making suggestions as to what you might have done with the material. One idea, however, is that you might have taken a position somewhere opposite the eighth or ninth piling from the end and shot toward the end one (the one nearest the camera in your picture). A gull or a human figure perched on top of the end piling then could have supplied a definite point of interest; and you could have left plenty of print area beyond this point, if needed.

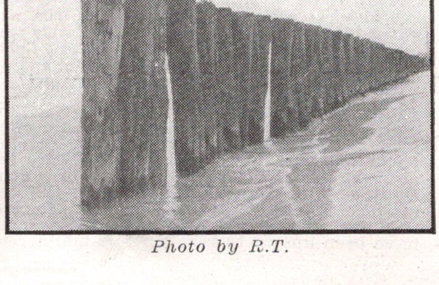


Photo by R.T.

Questions & Answers

H. McC., Fresno, Calif. In several recent attempts to photograph some old family silver, I have found that the bright surface of the metal reflects lights strongly in the highlights while other portions appear to be black. What can I do about this?

ANSWER: As the silver is highly reflective, place a number of white cardboards about the setup where they will reflect in the metal. Another idea is to rub the surface of the silver with putty to dull the shiny surfaces and thereby make it easier to photograph. You should be able to get very satisfactory negatives following these methods, all other conditions being proper.

L. M. M., Houston, Tex. I notice some small black specks on one of the inner surfaces of my camera lens. These definitely are not "bubbles," but seem to be some sort of foreign matter. I use a lens cap at all times when the camera is not in use, and am very careful to keep dust out of the camera. What can this foreign matter be?

ANSWER: In all probability some of the flat black surfacing with which the interior of the lens barrel is coated (to prevent reflections) has chipped off, and the flakes are moving about between the elements of the lens. A competent optician can remove these black specks for you.

A. H. L., Philadelphia, Pa. Why shouldn't I use sal soda in place of sodium carbonate in compounding photographic solutions, thereby saving money?

ANSWER: It is true that sal soda is another name for crystals of sodium carbonate, but you are cautioned against using the regular commercially packaged sal soda for photographic purposes, since its strength and purity may not be uniform. Changing weather conditions can alter the efficacy of sal soda too greatly for its safe use in mixing developers.

W. W. O., Chicago, Ill. Just what is the largest negative size referred to under the heading "miniature?"

ANSWER: A majority favors the 2¼ x 3¼" size as being the largest to qualify as "miniature." Some people arbitrarily set the outer limits at 2¼ x 2¼". The former dimensions are generally accepted, although when miniature cameras are referred to the 35 mm size is most often meant.

R. J. R., Hinsdale, Ill. Please tell me whether a portrait attachment is a positive or a negative lens.

ANSWER: A portrait attachment is a positive lens. When a portrait lens is placed over your camera lens, the combination of the two lenses has a shorter focal length than that of the camera lens alone.

J. M., Davenport, Ia. I have two yellow filters, the K1 and the K3. Can I obtain "special effects" such as extreme overcorrection by using the two together?

ANSWER: The most noticeable effect to be obtained by so doing would be to lessen the sharpness of your negative image about twice as much as you would when using one filter. Any filter will have some destructive effect on the sharpness of the resulting negative, depending upon the color, density, and quality of the filter itself. When you use a filter you are unbalancing the correction of your lens to some extent. Since a K1 will pass all the light rays a K3 will (and then some), the correction obtained by using the two together will equal approximately that obtained with the K3 alone. Also, the filter factor will be about the same as for the K3 alone. Never use two color filters in combination.

S. L. McK., Providence, R. I. Upon developing several of a dozen cut films I took on a motor trip recently I was surprised to see that some were fogged while others were not. All the film was exposed in the same camera, and I have every reason to believe that none of the films became lightstruck at any time. The batch of film was of a fairly fast panchromatic type. Can you help me out?

ANSWER: We suggest that, since you were on a motor trip, possibly a few of the film holders were left for some time in the *interior of your automobile. If this were so,* and the car had been standing in warm sunlight with the windows closed, the resulting high temperature might have fogged the film. The fast panchromatic emulsions have been known to react in this manner.

Letters to the Editor

Dear Sir:

Mildred Stagg writes in her good story *Woman's Place in Photography* (Sept., 1939) that my friend and pupil, Pat Liveright, was judged worthy to be admitted to membership in the Royal Photographic Society of Great Britain. A slight correction is in order. The R. P. S. will admit any woman as a member as long as she is interested in photography, in fact even if she is not but is willing to pay the membership dues. But Pat Liveright was made an *Associate* of the Society, and that is another matter. To become a *Fellow* is still a bigger trick, but the way Pat is advancing I would not be surprised if she has that F. R. P. S. tagged to her name in short order.

NICHOLAS HÁZ
New York City.

Dear Sir:

When I came upon that article by Frank Liuni *(We Want No Licensing Laws,* page 38, August, 1939) I was almost dumbfounded to find that this sort of thing was going on. Occasionally I have heard a few of these doings but it never struck me that the situation was that bad. Mr. Liuni made plenty plain what he was trying to put across, and I know all the amateurs are pleased to have an article written to the public protecting them. . . .

JOHN GOOLSBY
Pueblo, Colo.

Dear Sir:

The article *We Want No Licensing Laws* . . . is good but it is not correct in assuming that even a majority of professional photographers are in favor of such tactics.

These laws are being slipped through unthinking legislatures by little cliques of four or five individuals whose real purpose is to get themselves appointed to a board where they will benefit from the fees that must be paid by their competitors.

The notorious Tennessee law was slipped on the statute books by the connivance of a little clique *without the formality of being passed by the Legislature* . . . this law was declared unconstitutional . . . the court found that, "The making of a photograph for hire—does not effect public health, public morals, or public safety; and is not a proper subject for regulation." (This is quoted from memory, but it is essentially correct) . . . So keep up the good work. You have the cooperation of nine-tenths of the professionals.

GUY C. STEPHENS
Professional Photographer
Danville, Virginia.

Dear Sir:

Referring to your article . . . by Frank Liuni regarding state licensing laws that the photographers have had enacted in different states and are working on in quite a number of others, we feel that . . . it is only fair that you should put forth before the public both sides of the question. . . . He passes very lightly over the main reason that photographers have been forced to try to enact such laws, *i. e.,* because the general public as well as the professionals have suffered much harm by the majority of so-called photographic firms that hire men to go through the country, who not only produce inferior workmanship, but beguile the public with all kinds of schemes which in themselves are practically, as a whole, fraudulent.

Of course, with any of our laws, we do not try in any way to put strings on the purely amateur photographer. However, when he starts to sell his work at a profit, he is competing with legitimate business and he should be made to abide by any existing laws as regards professional photography . . . the amateur in most instances quotes his price far below what the professional can charge, which in itself constitutes unfair competition. . . .

Do you not think this subject of Mr. Liuni's should be presented from both angles, inasmuch as it is controversial?

R. W. NUNNALLY
Nunnally's Studio
Bluefield, W. Va.

• Our own opinion is that abuses can be eliminated without resorting to licensing legislation. We are planning to publish shortly an article giving the side of the professional.—ED.

Dear Sir:

. . . How about having as a regular feature of your mazagine a column to which readers could send in ideas to let the photographic manufacturers know what we the consumers want. Often I have thought of little gadgets which the manufacturers could very easily add to their products to save time and temper. . . .

WALTER K. ZINSMEISTER
Cazenovia, N. Y.

• We are always glad to receive suggestions from amateurs and pass worthwhile ideas on to the manufacturers by publishing them in our columns.—ED.

Dear Sir:

I look forward with pleasure to the coming of each issue of POPULAR PHOTOGRAPHY. I have graduated from the ordinary box camera to a Rolleicord and a Ciné-Kodak Eight by way of your publication.

You and your staff are to be commended for picking articles so clear that a novice like myself can follow the technique outlined. . . . W. Norwood Brigance should be commended for his clear and understandable writing of *Better Color Transparencies* (August, 1939).

DR. S. H. JOHNSTON
Austin, Texas.

• Thanks for the orchids. We have had a great number of complimentary letters on Mr. Brigance's article.—ED.

Dear Sir:

Having experienced considerable difficulty in the past regarding the mailing of photographs, it was with great pleasure that I read the article on page 38 of the September issue.

So, armed with the information the article provided, I ventured to the local post office. . . . However, the local postmaster was reluctant to take the word of Mr. Kruetgen. He agreed to give it a try . . . With the photograph was included a separate sheet with the technical data . . . Of this data sheet a duplicate was made for the postmaster. This duplicate he is going to send to the Third Assistant Postmaster of the Division of Classification in Washington, D. C., for an official ruling for the local files.

S. P. WELTMER
Nevada, Mo.

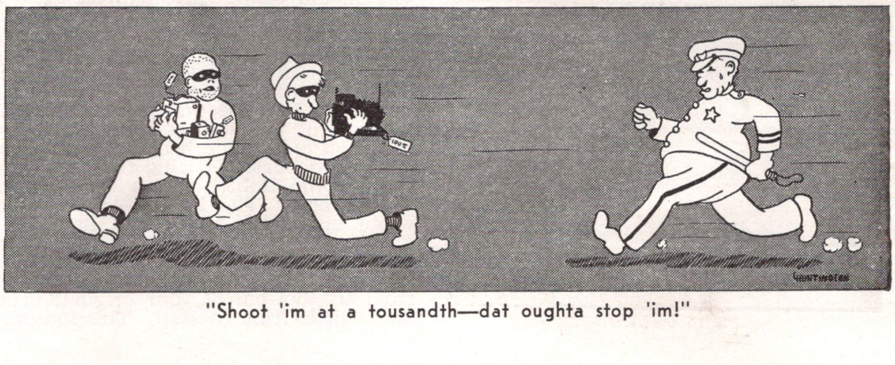
• Your experiment is an interesting one and we shall be awaiting a letter from you outlining the result.—ED.

Dear Sir:

I would like to compliment you on the educational side of POPULAR PHOTOGRAPHY. I have been doing my own processing for the last three months and can honestly say that before that time the whys and wherefores of photography had me stumped.

Such departments as *Picture Analysis, Print Criticisms,* and especially your *Questions and Answers* column have helped me greatly.

M. L. HARPER
Chicago, Ill.



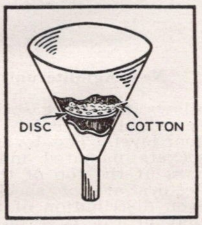
"Shoot 'im at a tousandth—dat oughta stop 'im!"

New Tricks FOR CAMERA OWNERS...

A monthly list of valuable kinks and hints for the amateur. POPULAR PHOTOGRAPHY will pay $3.00 for each one accepted.

Filtering Aid

LIQUIDS can be filtered through cotton much quicker if a perforated disc is cut to fit inside the funnel. This will keep the cotton from packing and permit a thin layer to be used instead of a large wad. The disc can be cut from some plastic material or even from a piece of tin. The tin should be coated with paraffin so as to prevent chemical reaction. A coat of chemical-resisting paint will serve equally as well.—*Roy F. Kaiser, Milwaukee, Wis.*



Disc in funnel.

Warns of Loaded Tank

AMATEURS who take advantage of the darkness of night to load their film tanks, then leave the loaded tank to be developed in the morning, often come to grief when they forgetfully open the tank the next day and fog the film.

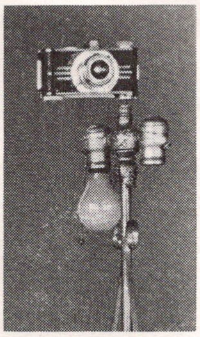
However, if the tongue of the film (if 35 mm), or the paper wrapping (if roll film), is slipped over the agitator knob immediately after the tank is loaded, it will serve as a warning that the tank is loaded and should not be opened. This idea is easy to use, and is especially convenient because the film tongues or paper leaders are right at hand when you need them for this purpose.—*Louis Hochman, Brooklyn, N. Y.*

Film tongue on tank agitator warns user.

Lamp-Base Tripod

ALTHOUGH comparatively few amateurs realize it, the screws on the tops of lamps (by means of which the lamp-shade is secured) will fit any standard American tripod socket. Thus, by removing the shade from one of your lamps you may use it as an exceptionally steady tripod for indoor work. The usual heavy lamp base reduces camera vibration to an absolute minimum.

By inserting a Photoflood bulb in the lamp socket and arranging a reflector, it is possible to obtain very good flat lighting by this method, making it quite useful in portraiture. Frequently these lamp bases may be obtained second-hand at very little expense, and if you are fortunate enough to secure one in this manner it may be used for your photographic work exclusively. — *George Tivy, Jr., Honolulu, T. H.*

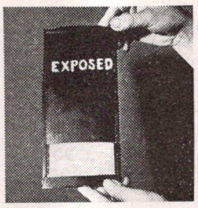


Camera and bulb in old lamp base.

To Prevent Double Exposure

A CONVENIENT method of preventing double exposure on cut films is to mark one side of the cut film holder's dark slide "EXPOSED." White enamel can be used, and is easy to apply with a camel hair brush.

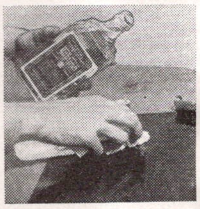
With the holder loaded, the printing is on the inside, but after exposure the slide is replaced with the printing on the outside where it is plainly visible and effective.—*Louis Hochman, Brooklyn, N. Y.*



The marked slide.

Oil for Ferrotype Tins

MINERAL oil is an excellent ferrotype polish. It doesn't allow the print emulsion to crack nor does it harden on the tin as does the benzine and wax dressing. Often there are spots on a glossy print when the wax and benzine mixture cakes and is not well polished off. The mineral oil need not be added each time the tin is used, but it is recommended that the tin be polished each time.—*Ernest Reynolds, Jr., Bristow, Okla.*



Applying oil to tin.

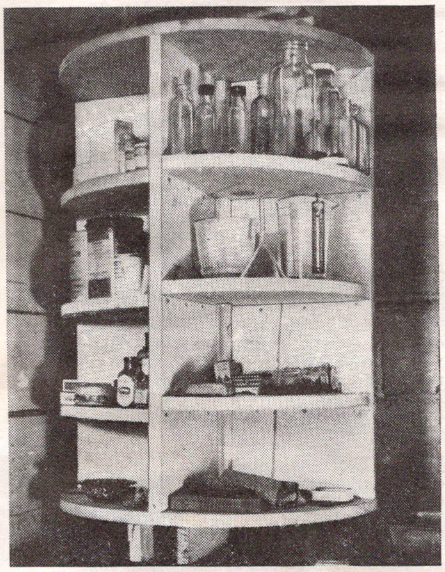
Sepia Contact Prints

BY a simple method, anyone can easily make permanent sepia contact prints from his favorite snapshot negatives. You don't need a developing solution and a printing box, or frame. All you need is some printing-out proof paper, some hypo, and some sunshine!

Simply place the negative and a piece of proof paper in contact (emulsion to emulsion) between two pieces of glass and hold it in the direct rays of the sun. Expose twice as long as you ordinarily would, because the print will bleach to some extent when it is fixed in the hypo. To fix the print, soak it for about 5 minutes in a solution made by dissolving 1 oz. of hypo in 4 oz. of water. When the print is placed in the hypo it will gradually change from red to sepia while it is bleaching and fixing. Wash and ferrotype the print as usual. The print will not turn dark as does the ordinary portrait proof made on printing-out paper.—*Arthur Trauffer, Davenport, Ia.*

Rotary Darkroom Shelf

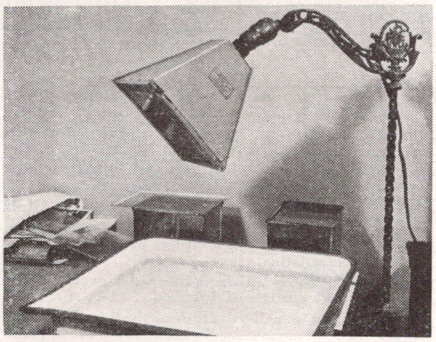
BESIDES saving space in the darkroom, this rotary shelf keeps supplies and accessories within easy reach and helps maintain an orderly place in which to work. It is constructed entirely of 1" stock except the center-post, which is a 3 x 3" piece. The assembly is mounted on a sawed-off bolt sunk in the center-post and turning in a hole drilled part way through a piece of flat cast iron. At the top there is also a bolt sunk in the center-post, and this turns in a hole in a board which is nailed to the ceiling. The shelf makes things so easy to see that, once you have used it, you will never want to go back to the old way of arranging your darkroom materials. — *Ed Moluf, Omaha, Neb.*



Revolving shelf keeps things handy.

Handy Safelight Support for Your Darkroom

AN old parlor bridge lamp-stand makes an ideal support for the darkroom safelight. The height of the stand keeps the light at a convenient level for developing prints. The light can be swung into any position by unscrewing the arm-piece one turn. Lamp-stands with heavy bases should be chosen to offset any possible top-heaviness of large safelights. The light is simply attached by screwing it into the light socket. A swivel-headed stand will enable the light to be directed as desired.—*J. Julius Fanta, Milwaukee, Wis.*



Light in position over print tray.

TRADE NOTES AND NEWS

TWELVE cut film or filmpack negatives from 35 mm to 2½x3½ can be developed in the new Elkay Roto Reel Film Pack and Cut Film Tank recently announced. Each film slips into one of the fan-like grooves of the adjustable bakelite reel and is held in place to prevent buckling or slipping. The reel is easily adjusted by sliding the top section up or down on the center core. The tank, complete, sells for $3.50. The Roto Reel, which will fit any standard roll film tank, may be purchased separately. Further details from your dealer or from Elkay Photo Products, Inc., 303 Washington St., Newark, N. J.

Roto Reel Tank

TIME and Life Building, Rockefeller Plaza, Rockefeller Center, New York City, is now the national headquarters of the National Photographic Dealers Ass'n. Dealers and friends are invited to visit the offices when in New York.

AN INGENIOUS post card device, the Pict-O-Graph, is announced by Benson Camera Co., Inc., 166 Bowery, New York City. This item is used for mailing small size pictures, after which it converts into an easel picture frame. It is available in frame sizes to accommodate prints from 35 mm up to and including 116-616, and is so constructed that the snapshot is protected in transit. Pict-O-Graph retails at 5 cents and can be obtained from your dealer or direct from Benson Camera Co.

RECENTLY announced is the new Ka-I-Ko Automatic Timefinder, a device in enlarging which automatically finds the correct exposure time for any negative, indicates the proper grade of paper to use, then automatically times the exposure. It may be coupled to any enlarger, permits faster working, and reduces paper wastage to a minimum. For further details and prices inquire at your local dealer or write to Ka-I-Ko Photo Products, 39 Bartlett St., Brooklyn, N. Y.

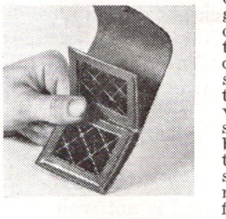
A NEW photographic accessory, the Law Photo Print Dryer, is announced by and handled exclusively through Marshall Field & Co., Chicago, Ill. This dryer takes six 11x14 or twelve 8x10 prints in alternate layers of finest quality blotters and corrugated paper. A masonite carrier with hinged end pieces allows the blotters, corrugated, and prints to be inserted and held in a curved position so that prints, when dry are perfectly flat. The dryer is priced at $2.25 postage prepaid.

RECENTLY announced is the new 2¼x2¼ Zeiss Ikoflex III camera, a twin-lens reflex with Carl Zeiss Tessar *f* 2.8 lens in Compur Rapid shutter with speeds from 1 to 1/400 second. Special features include plano-convex focusing screen with 4x magnifier covering entire screen, elimination of parallax, eye-level finder, automatic film transport and shutter winder, self-timer, shutter signal. The camera is finished in black morocco leather, black enamel, and satin chromium. The price is $199.00. For further information write to Carl Zeiss, Inc., 485 Fifth Ave., New York City.

AN ELECTRIC print dryer constructed to accommodate removable ferrotype tins is now being manufactured by Fedco Products. It has a polished lacquer surface; a removable, washable canvas held in place by a new type stretching device to hold prints firmly in place; heating element that uses only 105 watts (AC or DC); and is equipped with an Underwriters Approved 3000-cycle cord. The Fedco Print Dryer is priced at $2.95. Raygram Corp., 425 Fourth Ave., New York City, is the eastern distributor and Hornstein Photo Sales, 29 E. Madison St., Chicago, Ill., is the midwest distributor.

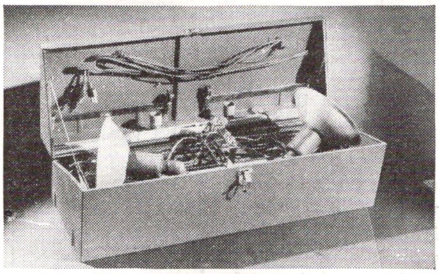
NEW IN the field of synchronized flash photography is the Robot Sequence Flasher. The device, 19" high and weighing 22 oz., accommodates three flashbulbs and reflectors. When attached to the synchronizer of the Robot II camera a bulb is fired every time the release button is depressed, or if more light is desired the three bulbs can be fired simultaneously. Prices and additional information can be obtained from Intercontinental Marketing Corp., 8 West 40th St., New York City.

ANNOUNCEMENT is made of the new Lumax Composition Meter, consisting of two translucent plaques mounted in a handy leather case. Upon each plaque is engraved a patented design which guides the position of principal and secondary subjects, and permits the photographer to view his scene and study composition before taking the picture. The meter serves also as a monochrome viewing filter, one plaque colored blue for orthochromatic film and one green for panchromatic. The meter is manufactured by the Lumax Photo Utilities, 4815 Cottage Grove Ave., Chicago, Ill., and retails through dealers or direct for $2.50.



Lumax Meter

A PORTABLE lighting unit of unusual flexibility, the "Agfalite," has just been introduced by Agfa Ansco Corp. A pantograph anchored to the base of the cabinet allows the light sockets and reflectors to be raised any height up to 94 inches above floor level. The device is equipped with two sockets mounted independently on sliding bars at the top of the mechanism, and reflectors are of special design to promote even distribution of light. Caster supports that fit the base of the unit facilitate its movement across floors, and other features include Approved Underwriters cord with separate outlet plugs, and a diffusion screen. The unit is supplied in brown crackle finish with pantograph and caster frames in nickel. The device, available through photographic dealers, retails for $25.00.



New Agfalite unit for indoor lighting

THE LINE of Solar Enlargers has been expanded with the introduction of the 4x5 and 5x7 Series. Their design incorporates many of the precision features found on fine miniature enlargers—solidity, quick adjusting, perfect alignment, removable lens board, modern design, and improved light system. They are available both in baseboard and wall type, and prices (without lens) range from $49.50 up. For additional details write to the manufacturer, Burke and James, Inc., 223 W. Madison St., Chicago, Ill.

A SPECIAL preparation which will protect and preserve still or movie film is now available to the amateur. Known as "Cinelac," the preparation is easily applied to still or movie film with a flannel pad and will prevent cracking, scratching, or curling of the film. A $1.00 bottle (2 oz.) will treat 150 4x5 negatives or equivalent, or about 1500 ft. of 16 mm cine film. Cinelac is distributed solely by the American Bolex Co., 155 East 44th St., New York City.

MODERN and compact in design, the new Hollywood Viewer-Projector for 2x2" film slides is announced by the Craftsmen's Guild, 5773 Olympic Blvd., Los Angeles, Calif. When used as a viewer a 4½" image is thrown on a miniature screen; by the turn of a knob the device is converted into a pro-

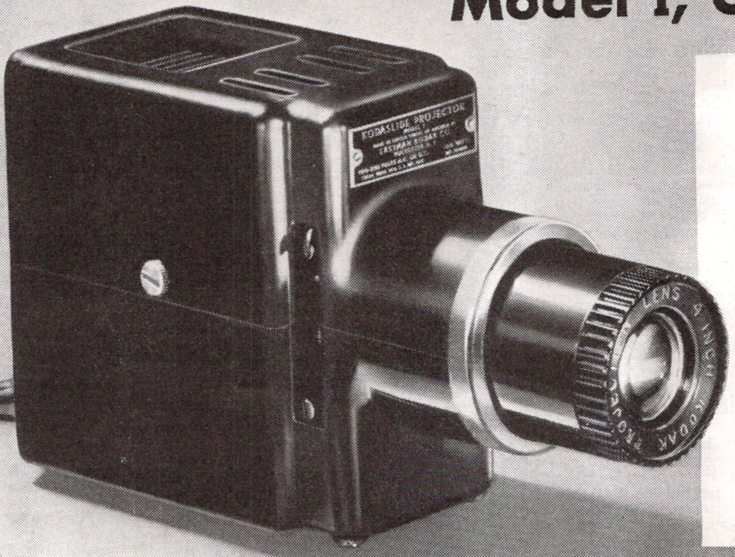
(Continued on page 106)

CALENDAR OF PHOTOGRAPHIC EXHIBITIONS

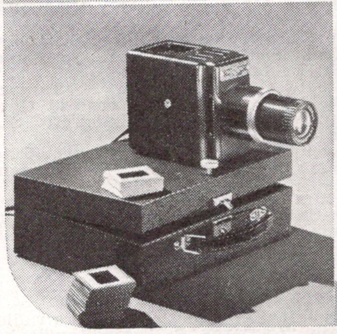
SALON	ADDRESS	ENTRY FEE	ENTRIES ALLOWED	CLOSING DATE	DATES OPEN TO THE PUBLIC
First Annual Atlanta National Amateur Photographic Salon	C. S. Mingledorff, 252 Peachtree St. N.W., Atlanta, Ga	$1.00	4	Sept. 18	Oct. 1—Oct. 15
14th Annual Salon of Photography, Museum of Fine Arts of Houston	Salon Jury, Museum of Fine Arts of Houston, Main and Montrose Blvd., Houston, Tex	$1.00	4	Sept. 23	Oct. 7—Oct. 29
4th International Exhibition of Photography, Windlesham Camera Club	Hon. Sec., Windlesham Camera Club, Hallgrove, Bagshot, Surrey, England	4s	4	Sept. 30	Oct. 16—Oct. 21
4th Annual Salon of the Cedar Rapids Camera Club.	Robert E. Campbell, Salon Sec., 2622 Country Club Pkwy., S. E., Cedar Rapids, Ia	$1.00	4	Oct. 1	Nov. 5—Nov. 19
New York Salon of Photography, under auspices of The Camera Club	Salon Committee, The Camera Club, 121 West 68th St., New York City	$1.00	4	Oct. 2	Oct. 29—Nov. 30
1st Annual Photographic Salon sponsored by the Lens Artists Camera Club	Lens Artists 1st Annual Salon, Chancellor Hotel, Parkersburg, W. Va	25c ea. $1.00 min.		Oct. 3	Oct. 6-Oct. 8
13th Annual Open Exhibition of the Lincoln Camera Club	Hon. Exhib. Sec., Miss E. Redfern, 364 Burton Road, Lincoln, England	1s per print	4	Oct. 7	Nov. 4—Dec. 3
4th Annual 100-Print Travel Salon, Metropolitan Camera Club Council, Inc.	Loan Exhibition Committee, Met. Camera Club Council, Inc., 106 W. 13th St., N. Y. C.	$1.00	4	Oct. 15	1939-1940
5th Annual National Philadelphia Salon of the Miniature Camera	Charles Heller, Salon Chairman, Architects Bldg., 17th & Sansom St., Philadelphia, Pa	$1.00	4	Oct. 16	Nov. 11—Nov. 26
10th Annual Photographic Salon, Rockford Art Association	Rockford Art Association, 737 North Main St., Rockford, Ill	$1.00	4	Oct. 20	Nov. 5-Nov. 18
1st International Cairo Salon of Photography	Commissioner, Société des Amis de l'Art, 34 Rue Hawayati, Cairo, Egypt	$1.00	4	Oct. 20	Dec. 1939
3rd Rhode Island National Salon of Photography	A. J. Viera, Salon Chr., Camera Club of R. I., 103 Westminster St., Providence, R. I.	$1.00	4	Oct. 30	Nov. 19-Nov. 25
8th Annual Minneapolis Salon of Photography	*Chairman* Salon Com., Minneapolis Camera Club, 113 So. 6th St., Minneapolis, Minn	$1.00	4	Nov. 4	Dec. 3-Dec. 31
Springfield Salon of Photographic Art (2nd Pictorialists International)	John Funaro, Director, 110 Rochelle St., Springfield, Mass	$1.00	4	Nov. 30	Jan. 3—Jan. 31

Kodachrome fans—here's that low-priced KODASLIDE PROJECTOR you've been waiting for . . .

Model 1, ONLY $18.50

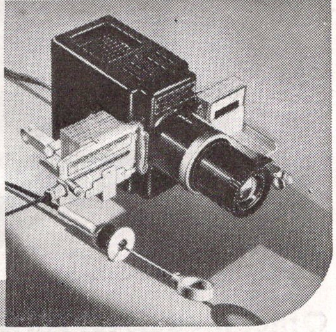


KODASLIDE PROJECTOR, MODEL 1, for projecting Kodachrome transparencies or black-and-white film positives—Bantam or 35 mm.—in 2"x2" glass slides or Ready-Mounts. Small, efficient, thoroughly dependable. High-quality 4-inch lens and improved illumination system yield excellent 27x40-inch and larger images. Simple focusing and operation. Highly polished black molded body, insulated for coolness. Supplied complete with lamp, 11½-foot cord, plug. Price, $18.50.



Projecto Case for Kodaslide Projector, Model 1, combines carrying case and projection stand. Has screw that attaches to tripod socket in bottom of projector. Thumb screw adjusts cover to center pictures on screen. $4.

Kodaslide Ready-Mount Changer for use with Kodaslide Projector, Model 1 or 2. Provides magazine feed and ejection for up to 50 Kodachrome "stills" or black-and-white film positives mounted in Ready-Mounts. $12.



Kodachrome Transparencies are now returned to you mounted in Kodaslide Ready-Mounts* (no extra charge)

KODACHROME
KODACHROME

THIS service applies to "still" Kodachrome Film, regular or Type A, No. 828 or No. 135. Includes lacquering emulsion side of film after processing, cutting frames apart, and mounting each in a Kodaslide Ready-Mount—at no extra charge.

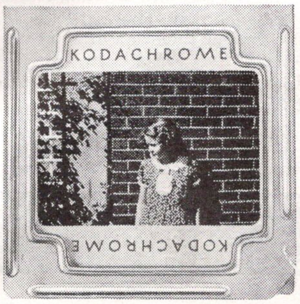
Transparencies so mounted can be projected in Kodaslide Projector, Model 1 or Model 2. Also in Kodaslide Projector, Model A, with the aid of the Ready-Mount Adapter, or by inserting mounts in Ready-Mount Metal Frames.

Free descriptive literature on Kodachrome supplies. At your dealer's, or write Eastman Kodak Co., Rochester, N. Y.

*Unless otherwise specified

READY-MOUNT METAL FRAMES

Adapt Ready-Mounts for use in Kodaslide Projector, Model A, and other projectors. After projection, Ready-Mounts can be removed from Metal Frames and others substituted. Box of 6, 60¢.

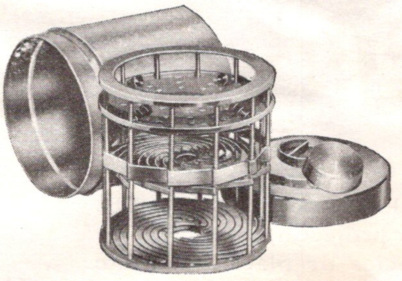


NIKOR

Anti-Fog Stainless Steel

TANKS

MADE IN U. S. A.

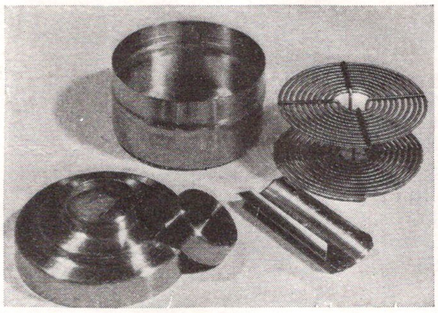


NEW ADJUSTABLE MODEL

for Cut Film and Film Packs

from 2¼ x 3¼" to 4 x 5"

Here is the adjustable developing tank that is made entirely of corrosion-proof stainless steel. This new NIKOR takes up to 12 cut film or film pack negatives from 2¼ x 3¼" to 4 x 5" or postcard size. Quickly adjusted for any specific size film. Film is inserted easily in complete darkness without danger of buckling or scratching. Requires from 24 to 36 oz. of solution, depending on size of negative. Made entirely of welded stainless steel. Easy to keep spotlessly clean. Price, complete, only **$11.50**



Model 35 Nikor Stainless Steel Tank

Other Models for All Roll Film from 35 mm. to Postcard Size

Model 35 Nikor, develops a roll of 35 mm. film in only 8 oz. solution........................**$4.75**

Model 33 Nikor, develops two 35 mm. rolls at same time in 16 oz. solution................**$8.25**

No. 1 Nikor, for V. P. (127) film............**$5.75**

No. 2 Nikor, for 2¼x3¼" or 6x6 cm (120)..**$5.75**

No. 4 Nikor, for 2½x4¼" (116) film........**$5.75**

No. 5 Nikor, for 3¼x4¼" (118 or E6) film.**$7.50**

No. 6 Nikor, for 3¼"x5½" (122 or G6) film.**$7.50**

Extra deep Nikor Tank (no reels included), for multiple developing of four No. 33 or No. 35 reels, three No. 1 reels; two No. 2 or No. 4 reels; one No. 5 reel; with rod on which to string reels.**$6.00**

New Nikor Washing Tank, especially designed to flush out all chemicals through a drain at the bottom **$6.00**

Extra Reels, any size.................**$2.85** each

Nikor Print Paddle and Stirring Rod..........30c

Ask your dealer to show you genuine Nikor Products — the original and only daylight developing tank made entirely of corrosion proof stainless steel.

BURLEIGH BROOKS
INCORPORATED
127 WEST 42nd STREET NEW YORK

What the Camera Clubs Are Doing

Boston Club Educates Novices in Camera Fundamentals

A helpful program of instruction is a regular part of the work being done by members of the Wells Camera Club, 985 Washington St., Boston, Mass. The beginner is shown how to use his camera properly, how to develop film, and how to make contact prints and enlargements. Advanced members help their less experienced colleagues to correct errors, offering constructive advice on the choice of papers, print quality, composition, etc. Meetings are held on Monday, Wednesday, and Friday evenings at the Wells Memorial Institute. Frank J. Wood is president of the club.

Islanders Vie for Awards

The Maui Camera Club of Hawaii recently took the lead in a spirited competition for the Hawaiian "All Round Club Trophy," with the Honolulu Camera Club running a close second. The Maui club's recent salon exhibition was a great success, the office being swamped with requests for the sale of a great number of club prints. The monthly club contests have attracted many excellent entries, including some very competent color prints turned out by the wash-off relief process. The movie division of the Maui club is anxious to trade selected short features with other groups of motion picture enthusiasts. Write to the publicity chairman, Noel Atkinson, care of Hawaiian Commercial and Sugar Co., Ltd., Puunene, Maui, T. H.

De Molay Order Holds Contest

Sponsored by the organization's world's fair committee, the De Molay Order recently completed a nation-wide photographic contest. Four prizes and an honorable mention were awarded. the winners, in order, including Robert Troell, Brooklyn, N. Y.; Frederick N. Parsons, Shirley, Mass.; William Bills, Mineola, N. Y.; Ray Spofford, Haverhill, Mass.; and Samuel Hannah, Providence, R. I.

Richmond Group Plans to Photograph State Industries

Latest objective of the Camera Club of Richmond (Va.) is the making of sequence photographs depicting steps in the various industries being carried on in the state of Virginia. First project to be described in pictures will be the making of bread, with photos being taken of every step, from the planting of the wheat to the actual serving of the food in Virginia homes.

The club is investing several hundred dollars in photographic equipment for the studio at 14 South 7th St., Richmond, and in its library, which rents photographic books to members for 5c a week.

The Richmond club, together with the Norfolk Camera Club and the Appomattox Camera Club, recently were guests at an all-day picnic which was held at the summer cottage of Mr. and Mrs. Jack LeMay, on the Rappahannock River.

So. California Council Forms

At the recent first annual meeting of the Southern California Council of Camera Clubs, delegates were present from the following organizations: Triangle Camera Club, Los Angeles Camera Club, Westways Camera Club, and Pan Camera Club, all of Los Angeles; Paramount Camera Club and Disney Studio Camera Club, of Hollywood; Metro-Goldwyn-Mayer Camera Club, Culver City; Huntington Park Camera Club; Channel City Camera Club, Santa Barbara; Ventura County Camera Club, Ventura; Foothill Camera Club, Monrovia; Corona Camera Club, Sherwood Oaks; Willowbrook Camera Club; Camera Club of Long Beach; Pomona Camera Club.

The council would like to hear from other clubs in Southern California and adjacent vicinity. Inter-club salons, print show exchanges, outings, and a speakers' bureau will be managed by the council, which will be affiliated with the Photographic Society of America. The council may be addressed in care of Malcolm G. Lowe, vice-president, 2504 West 7th St., Studio 5, Los Angeles, Calif.

P.S.A. Announces Rules for Continental Monthly Contest

Any camera club on the North American continent is eligible to compete in the series of monthly print contests announced by the Photographic Society of America. Geographical division of entries will be made according to Standard Time zones, the three sections being as follows: Atlantic and Eastern; Central; and Mountain and Pacific. Medals and certificates will be awarded. Further information and complete sets of rules may be obtained from the Society, at 10414 111th St., Richmond Hill, New York.

List of Clubs Increases

The following clubs would appreciate hearing from you. Some are newly-organized, others have been in operation for some time. You may be able to exchange prints or ideas or both with these groups which have in common with you an interest in photography as a hobby:

College Hill Camera Club, Vernon Hacker, Pres., 5207 Blair Ave., St. Louis, Mo.

Powell Valley Camera Club, Don King, Sec., Appalachia, Va.

New Haven Camera Club, Sherwood Fehn, Sec.-Treas., 400 Norton Parkway, New Haven, Conn.

Loudonville Camera Club, Glen Crow, Sec., Loudonville, O.

Greenville Camera Club, H. L. Sellars, Greenville, Pa.

Lens and Shutter Club, W. Ridgeway Chafey, Sec., Princeton, N. J.

Yankton Camera and Cine Club, L. A. White, Sec., Yankton, S. D.

Out of Focus Camera Club, Gerard Sullivan, Sec., Electric St., Dunmore, Pa.

Vancouver Photographic Society, Miss D. Hacking, Sec., P. O. Box 566, Vancouver, Canada.

Utica Camera Club, Hobart Price, Sec., 317 Leah St., Utica, N. Y.

Eastern High School Camera Club, Irving Miller, Pres., R. F. D. 3, Bethesda, Md.

Hermitage Photographic Society, Jack Ansley, Pres., 162 4th Ave., N., Nashville, Tenn.

Amateur Motion Picture Club of St. Louis, Eloise Koch, Sec., Y. M. C. A., 16th and Locust, St. Louis, Mo.

Junior Girl's Camera Club of Tampa, Connie St. Johns, Sec.-Treas., care of Gatteri's Camera Shop, 438 W. Lafayette St., Tampa, Fla.

The Aremac Club, E. D. Lewis, Pub. Chmn., 1810 Washington St., Wilmington, Del.

Palo Alto Camera Club, care of the secretary, 309 University Ave., Palo Alto, Calif.

St. Louis Post Office Camera Club, John Singer, Pres., Post Office, St. Louis, Mo.

We Hear—

THE Washington Camera Council's radio program "Cameras in Action" will be continued throughout the autumn. Several prominent figures have been guests on the show, which is aired over station WRC (NBC) at 9:45 p. m. (E. S. T.) each Friday evening . . .

Twin City C. C.'s "View Finder" contributes a bit about an evening when a club's print criticism wasn't going so well. Regarding one somewhat pathetic 8 x 10, the critic asked "Any criticism? Maybe a little cropping?" From the back of the room came a reply: "Yeah—about nine inches off the bottom." . . .

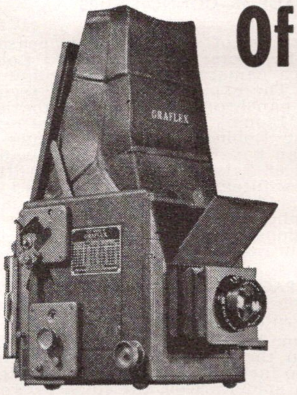
The popularity of the field trips sponsored by *Miniature C. C. of Oakland* (Calif.) reaches its climax each Labor Day weekend, when cabins and camp sites are engaged at some spot which is especially rife with pictorial possibilities. The club's regular news letter "The Panoram" is neatly done and easy to read . . . Officials of the New York World's Fair have set aside Oct. 6 as Photographic Society of America Day. On that date the Society opens its 5th Annual Convention, at New York City's Hotel Capitol . . .

Since its inception 20 years ago, *California C. C.'s* "View Finder" has blossomed into a really pretentious little journal, whose typography, printing, and photographic reproduction all rank high. Two decades of continuous publication is a fine record, and here's wishing the club the best of luck . . .

(Continued on page 110)

Made by Herbert Dallinger with a 4x5 Series B Graflex

Of Course, Mr. Dallinger Used a GRAFLEX



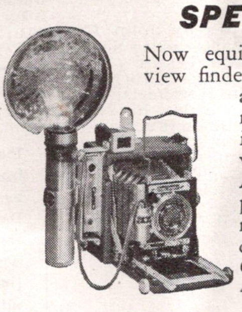
Series B GRAFLEX

Here's the camera that made the unusual "stopped action" picture shown above. This camera has full-vision ground glass focusing, focal plane shutter with a wide range of speeds and revolving back for either vertical or horizontal subjects. Yet it is popularly priced. Three sizes: 2¼ x 3¼, 3¼ x 4¼ and 4 x 5.

While in New York for the World's Fair, visit the new Graflex Display Rooms, 50 Rockefeller Plaza.

Most outstanding pictures *are* taken with Graflex-made cameras. For serious photographers—amateurs and professionals alike—depend upon them for hard-to-get shots that win prizes and recognition. Because all Graflex American-made cameras provide easy, precise, fast focusing, accurate ground glass or eye-level view finder framing, high speed focal plane shutter, lenses of highest quality and film sizes that permit enlargement without loss of detail, serious hobbyists in ever-increasing numbers are choosing these cameras. Of course, Mr. Dallinger used a Graflex . . . Eventually you, too, will get a Graflex or Speed Graphic American-made, Prize-Winning Camera. Why not make your selection now—at your Dealer's?

Versatility Plus! 2¼ x 3¼ Miniature SPEED GRAPHIC



Now equipped with a new tubular view finder that corrects for parallax and uses interchangeable lens matching masks, this Miniature Speed Graphic is more versatile than ever before! And it features built-in focal plane shutter flash synchronization for picture-taking day or night! Other Speed Graphic sizes: 3¼ x 4¼, 4 x 5 and 5 x 7.

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DEPT. PP-28, ROCHESTER, N. Y., U. S. A.

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	19-21	22-24	25-28	29-33	34-38	39-43
Yellow, Univ. Green, Red or Blue Filters	$2.15	$2.40	$2.40	$2.75	$3.00	$3.50
U. V. or Reform	2.75	3.00	3.00	3.50	4.25	5.50

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Exactly Fitting Lenses of These Diameters	Yellow, Universal, Green, Red or Blue Filters	Ultra-Violet and Graduated Filters
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These ingeniously designed accessories make any lens a soft focus lens—giving a pleasing artistic effect. Made in two powers: "0" and "1". Mounted in metal cells, cap-over style, and priced from $5.00 to $7.50 according to size, as follows:

27 mm. diam.	$5.00	35 mm. diameter	$7.50
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32 mm. diameter	$7.50	42 mm. diameter	$8.50

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Notes on the Salon Section

PAGE 39—PICTURE OF THE MONTH

J. F. Abbott made this photograph in Holland with a 9x12 cm Zeiss Ideal B camera and 13.5 cm Zeiss Tessar *f* 4.5 lens. The exposure was 1/50 second at *f* 16 on Agfa Super Plenachrome film. The photograph is from the exhibit of the Photographic Society of America which hung in the Eastman Kodak Building at the New York World's Fair.

PAGE 40—CORN

The photograph of seed corn which serves as the background for this page was made by J. W. McManigal with a 4x5 Speed Graphic camera and 5½" Kodak Anastigmat *f* 4.5 lens on Agfa Isopan. It was taken in the studio, using a spotlight and Johnson Ventlite for a fill-in. The exposure was 1 second at *f* 32.

McManigal photographed the cross-section of the ear of corn with a 3¼x4¼ Auto Graflex and 7½" Kodak Anastigmat *f* 4.5 lens. The illumination was furnished by Photofloods in reflectors and the exposure on Eastman Super Sensitive Panchromatic film was about 1 second at *f* 32.

PAGE 41—WINE

The fisherman was photographed at Juan les Pins, France, by Mme. Relang. She used a 2¼x2¼ Automatic Rolleiflex camera and 7.5 cm Zeiss Tessar *f* 3.5 lens. The picture was taken on a dull day, and the exposure was 1/100 second at *f* 5.6 on Eastman panchromatic film. Photograph from Three Lions.

José Alemany made his photograph with a Contax I camera and 5 cm Zeiss Tessar *f* 3.5 lens. It was taken in summer sunlight, and the young model is his son, James.

PAGES 42-43—BALLET RUSSE

This interesting group of photographs by George Leavens was made at the Metropolitan Opera House in New York City. All of the pictures except Nos. 1, 2, and 4 on page 43 were taken with a Contax II and either a 50 mm Sonnar *f* 1.5 or 85 mm Sonnar *f* 2 lens. Exposures on Agfa Superpan Supreme ranged from 1/50 to 1/100 second with the lens in use wide open. The three other pictures were made with a 2¼x2¼ Zeiss Super Ikonta B and 8 cm Zeiss Tessar *f* 2.8 lens. Exposures were all 1/25 second at *f* 2.8 on Agfa Superpan Press film. The two cameras were mounted side by side on a dural bar with a cable release for the Super B and a mouth release for the Contax. This enabled him to make sequence shots in black-and-white or to shoot both color and black-and-white at the same time.

Leavens took most of these shots from the prompter's box. The next best position, he advises, is a box near the stage in the dress circle. Few pictures of dancers are successful unless the feet are shown and this is rarely possible from the orchestra. Regarding shutter speed Leavens says, "These are all action shots. Slow shutter speeds could not as a rule be used even for a seeming tableau, because dancers who suddenly strike a pose after a routine are quivering from muscular tension and breathing hard. This is unnoticeable even from the prompter's box, but it destroys critical sharpness at speeds slower than 1/25 or 1/50 second."

PAGE 44—FOX HUNT

The two splendid photographs by John H. Vickers were made with a quarter plate Soho Reflex camera and 7¼" Zeiss Tessar *f* 4.5 lens. The picture of the hounds returning from the hunt was made in Hertfordshire, England. While motoring one day he saw them approaching in the distance, hurriedly seized his camera, focused on the far edge of the water puddle, and snapped the picture when they reached that point. The exposure was 1/50 second at *f* 4.5 on Golden Iso Zenith plate.

The wild fox cub was lured from its hole by a dead rabbit which was placed near the entrance. The exposure was 1/20 second at *f* 4.5. This picture was taken at Staffordshire.

PAGE 45—FLIRTATION

In making these two clever setups, George A. Thompson used two lemons for models and an auto made of cardboard and modeling clay. Match sticks, cotton, crepe paper, thumbtacks, and more clay were employed to "make up" the models. One 500-watt spotlight and 2 No. 1 Photofloods furnished the illumination. Thompson photographed the setups with a 3¼x4¼ Linhof camera and 15 cm Zeiss Tessar *f* 4.5 lens. The exposures were 1 second at *f* 32 on Agfa Commercial Panchromatic film.

PAGE 46—ILLUMINATION

Frank Cleveland, organist at Trinity Church, New York, has made two exceptionally fine night shots shown here. The boat picture was obtained after a 2-hour wait to get a clear shot. It was taken with a Contax I and 50 mm Zeiss Tessar *f* 2.8 lens, 4-minute exposure at *f* 8 on Eastman Panatomic-X film.

The second picture, taken at the New York World's Fair, was made with a 2¼x3¼ Speed Graphic camera and 4½" Bausch & Lomb *f* 4.5 lens. The exposure was 2 minutes at *f* 8 on Eastman Panatomic-X film.

PAGE 47—TIGERS

Martin Munkácsi photographed the tigers at the Winter Garden, Berlin, with a 9x12 Mentor camera and 15 cm Dallmeyer *f* 1.9 lens. The exposure was 1/250 second at *f* 2.3 on Wellington plate.

PAGE 48—PORTALS

The photograph by George Hukar shows the Library of the Pharmaceutical Building, Washington, D. C. The picture was taken with an 8x10 Eastman view camera and 12" Goerz Dagor lens on Agfa Superpan film. Illumination was furnished by several Johnson Ventlites. It is one of a series of illustrations used in an article describing the architectural beauty of this building.

Robert McCullough made his picture of an abandoned house near Hoopeston, Ill., on the Dixie highway. He used a 35 mm Weltini camera and 2" Schneider Xenar *f* 2.8 lens. The exposure was 1/50 second at *f* 5.6 on Eastman Pantomic-X film.

PAGE 49—CONNOISSEURS

The photograph of the Albanian peasant drinking coffee was made by Bernd Lohse with a Leica camera and 50 mm Summar *f* 1.2 lens. The exposure was 1/100 second at *f* 3.5 on panchromatic film. Photograph from Three Lions.

M. Arthur Robinson took the picture of the Hawaiian boy with a 4x5 Auto Graflex camera and 6" Zeiss Tessar *f* 4.5 lens fitted with a yellow filter. The exposure was 1/50 second at *f* 16 on Eastman panchromatic film. This photograph has been hung in several exhibitions and was reproduced in the French picture annual, *Photographie.*

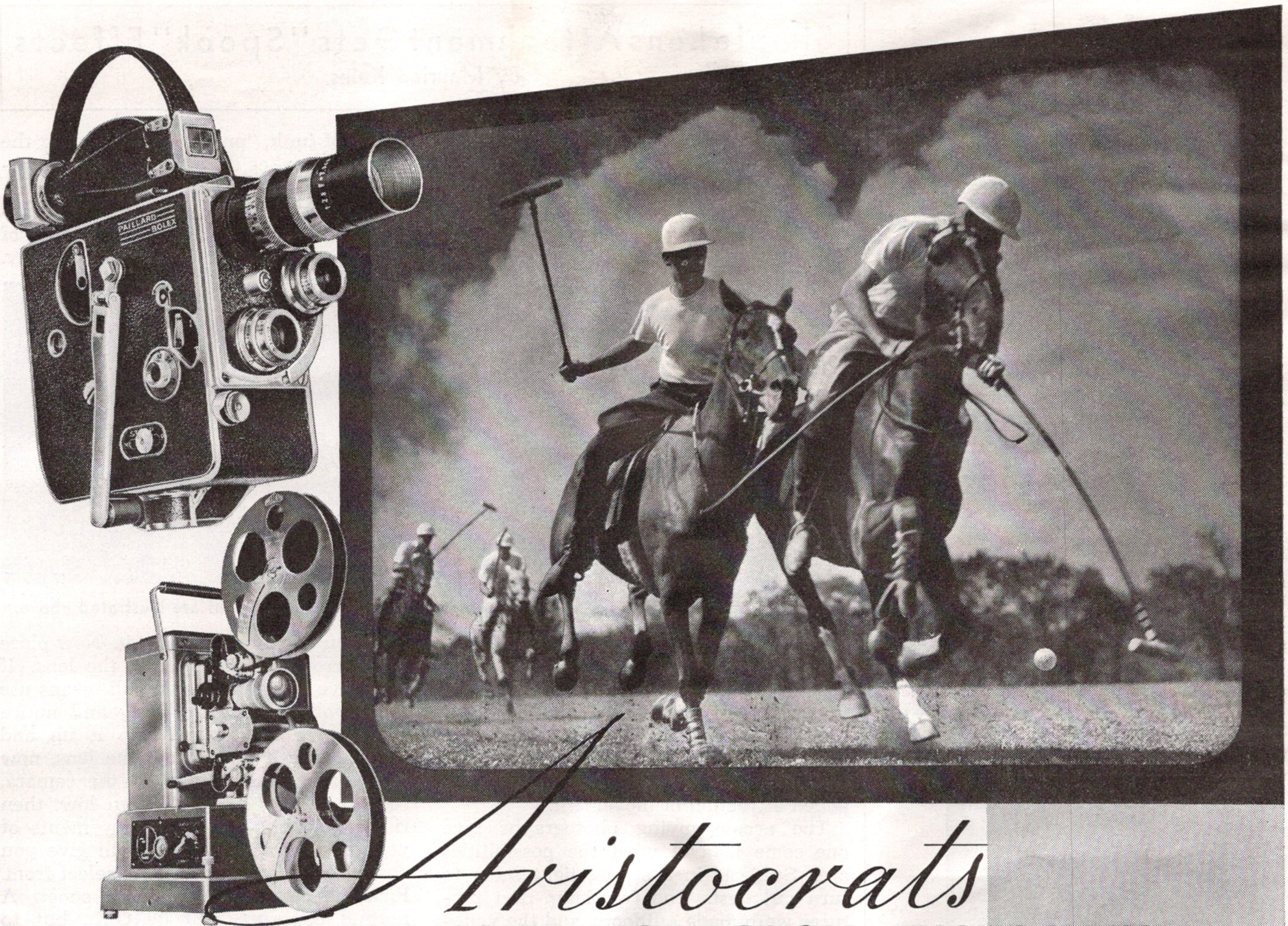
PAGE 50—PHOTOGRAM

This unusually clever picture by Fred G. Korth was made directly on sensitized paper as shown in the diagram. A spotlight directed at the faceted reflector cast a pattern similar to a spider's web, the folds between facets appearing as bright lines in the reflection. With the sensitized paper in position an exposure of 1 second was made. Next, a sheet of black paper out of which the figure of a spider had been cut, was laid over the sensitized paper like a printing mask, and another exposure made. This interesting photogram is an example of what can be done without camera, lens, or film.

THE OCTOBER COVER

The illustration on this month's cover was made from a 35 mm Kodachrome transparency taken by Henry Sill of Sage Studio, New York City. The photographer used a Model G Leica camera and 50 mm Summar *f* 2 lens. The picture was taken in the studio, on Type A Kodachrome (indoor), and the exposure was 1/30 second with the lens stopped down to *f* 4.5.

Illumination was furnished by movie floods which were arranged to give brilliant but flat lighting suitable for color photography. The model is Miss Mary Zachary.



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Ask your dealer to demonstrate how Bolex masters every movie-making situation. Have him show you, also, the warranty enclosed with every instrument giving camera and lens numbers and a strip of film exposed with that camera and lens. If your dealer is not an authorized Bolex dealer, he can get a camera or projector in a few days by wiring his order.

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Many other Bolex features are described in our 36-page catalogue. Write to Dept. G-5.

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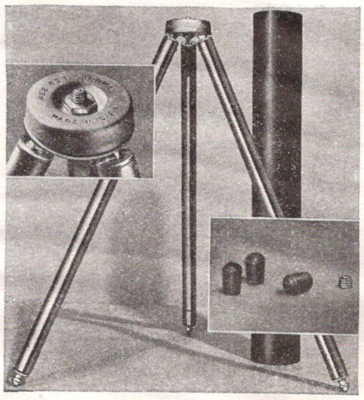

New Bee Bee Chrome Tripod

HERE is a moderate priced tripod that is both sturdy and compact. The head, as well as entire top section, is heavily plated with chromium. Legs are of drawn brass, with double locking pins to make them rigid. Rubber tips prevent slipping and scratching when tripod is used on floors. Legs may be adjusted as desired without loosening the screws at top that hold camera firmly in position. Packed in a durable tube-shaped container that is weather-proofed with Skytogen and may readily be used as a convenient carrying case. Available in the following sizes:

3-sections; closed, 16½″, extended, 42″...... **$2.75**
4-sections; closed, 15½″, extended, 48″.... **3.75**
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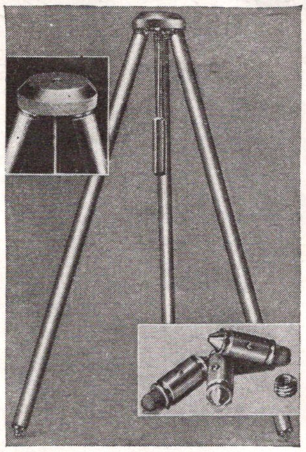

New Bee Bee ATLAS All-Chrome Tripod

This new Bee Bee tripod is suitable for use with all types of cameras—even the heavy 5 x 7 models and cine cameras—and is easily adjusted to the ideal height for use with reflex cameras. It has reversible feet which are pegged on one side and rubber-tipped on the other.

Though the legs are of rigid, heavy wall construction, the tripod is extremely light, weighing only about three pounds. When closed, legs are only 23 inches long. Open, they extend to 60 inches. The tripod is unconditionally guaranteed against mechanical imperfections and is packed in a neat tubular container, weather-proofed with Skytogen, which may be used as a carrying case. By far the best value in tripods of this type, as the price is only.... **$7.50**

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Also—a new Tilt Top tripod head, all-chrome finish, selling for only.......................... **$2.50**

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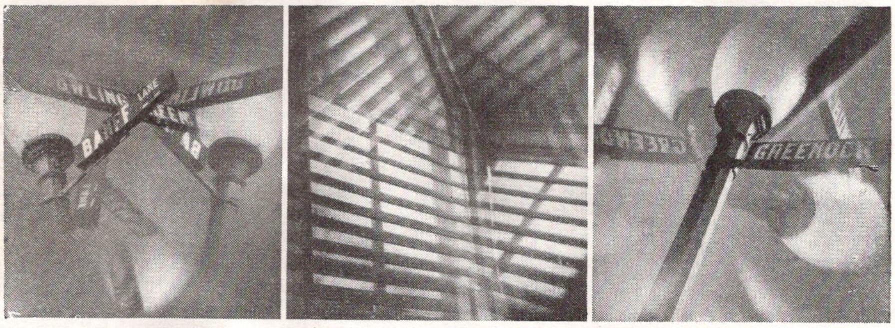
Simple Lens Attachment Gets "Spook" Effects

By Maurice Kains

GHOSTLIKE effects, often resembling montage shots, can be made easily with any camera, and without double-exposing. Of course, a groundglass camera, especially the single-lens reflex type, will simplify matters a great deal and give more assurance at the time of shooting as to just exactly what the results will be. There is far more latitude and variety because of that advance information that the reflex gives. These drunken, dizzy, screwy shots can also be made even with any movie camera, with the added attraction of movement.



Some of the weird effects so easily obtained with the mirror attachment are illustrated above.

The accompanying photographs give one some idea of what the possibilities are. Subjects in a strong light seem to turn out best. The two lamp-post pictures were made outdoors, and the venetian blind shot indoors, shooting up at the blue sky. The more dignified and erect your subject, the more drunken it can be made to appear by contrast. One could make a three-headed cat with a little patience. Are you interested? Well then—here's how.

Get an old mirror, a cheap one will do. The thinner the glass the better. Cut it, or have a glazier cut it for you into three strips. I cannot say what size will be best, for effects vary according to the focal length of your camera lens and the width and length of these strips of mirror. Those I used to make the accompanying photographs are 2 inches wide and 4¼ inches long. I would suggest drawing an equilateral triangle on a piece of paper first, to find out in advance whether or not your lens would slip inside the triangle easily. Continue enlarging this triangle until sufficient size has been obtained to slip over your lens *easily.*

Now measure any side of this triangle. This will give you the width your strips should be. The length is a matter of personal choice. I think that perhaps a length of 4 in. is ample. After you have your three uniform sized strips of mirror cut, bind them together with adhesive tape so that the three pieces form a triangular tube with the reflecting surfaces on the inside. That's all there is to it.

I am told that cloth designers often use such a gadget to help them in creating new geometrical designs for ladies' dress materials. They simply look through the tube at a table covered with all sorts of pieces of junk, "props," etc. Rotating the tube also makes changes which can produce interesting effects.

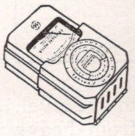
Let's try making a shot. Select an interesting subject. Perhaps a group of neon flashing signs will prove worthy. Aim your camera and focus it. Now place the mirror tube in front of the lens. If you have a groundglass by all means use it. Revolve the tube slowly and notice the change in designs. Tip it up and down, move it away from the lens, now bring it back again. "Pan" the camera, rock it sideways, squat down low, then rise up again. All these movements of your camera and the tube will give you an endless variety of shots to select from. Pick the most interesting and shoot. A normal exposure will be O.K., but to play safe, overexpose very slightly.

If you double-expose your art titles for your home movies here is a way to get some real screwy effects for a drunken sequence. Perhaps you can work up some other weird effects with the aid of only two or even only one mirror in front of your camera lens.—

Add "Smoke" to Your Prints

SMOKE rolling from a chimney, or a cloud of dust around home plate as "Kelly" slides in, can easily be added to a print with face powder. The most inexpensive kind will do very well, and a ten-cent can will last forever. This trick can be used in contact printing and enlarging as well. Somewhat more accuracy may be required in contact work, due to the relatively small images being dealt with. Simply take a pinch of powder and sprinkle it on the negative wherever clouds or dust are desired.

If an extreme enlargement is to be made, it is better to focus the image on the easel and apply the powder to the bromide paper while the red filter is over the lens. The exposure of the print is not affected in any way; and a test strip will show if the amount of powder used is sufficient. The powder does not harm print or negative, and if carefully used in printing a portrait it can be very effective in creating a handsome background of halftones. With a little experimentation, many uses will be found for this stunt.—*Chas. E. McDonald, Cincinnati, Ohio.*



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The hood on the G-E meter excludes stray light—admits only the correct light. You can check this yourself by pointing the meter—with the hood—toward a bright light source, then turning it away slowly. Watch the indication change! That's the sharp directional effect. That's why you get the *correct* camera setting.

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Remove the hood and read the meter in a dimly lighted corner. You can see that the G-E meter will make it easy to take good pictures of poorly lighted scenes.

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Eveready Camera Harness Leaves Both Hands Free

by G. Everett Van Horn

A HANDY neck strap will enable you to carry your plate camera about when making a series of exposures, ready at a moment's notice. From heavy wire cut two lengths and bend them into ¾" squares. Cut out two strips of heavy tin or light brass, each 4" long and about ⅝" wide. Fold each strip over the ends of the wire square, and fasten to either the front or rear corners of the camera frame sides, near the top, using short screws.

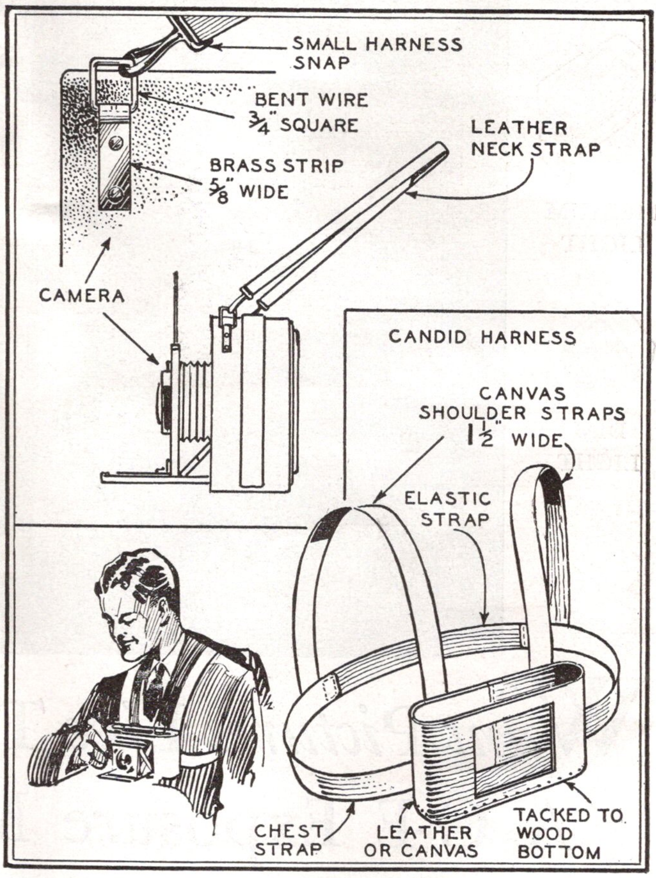
Stitch or rivet two small harness snaps to the ends of a leather strap, 1" wide. The strap should be just long enough to bring the camera at a comfortable position against your chest when it is carried. When not in use the snaps can be removed, and the buckle-shaped wires folded down against the sides of the camera box.

For the miniature or candid camera fan, a little light harness will have real appeal, for it leaves both hands free, and brings the camera snugly against the chest where you can quickly snap your shot at random. An elastic band at the back enables you to lift the camera in its harness to a level with the head for using the viewfinder.

Use canvas web straps, from 1" to 1½" wide, in making the chest and shoulder straps as shown in the drawing. A wide elastic strap is stitched at the back to enable you to slip the harness on and off easily, or to bring the camera to eye level.

The camera holder is cut from heavy canvas duck or khaki, to fit snugly around the camera. Cut out an opening in the front if the camera is a folding type, or just a small opening for the lens if of the universal focus type.

Whittle out a thin board, with rounded ends, to serve as a floor and brace for the camera holder, tacking the lower edge of the canvas to the edge of the board. The front ends of the shoulder straps, and front of the chest strap are stitched to the back of the camera holder.—■



Camera Witness

WHILE passing a large shipping and express office in New York City, I was surprised to see a messenger lay his package down at the end of the long line of errand boys and truckmen waiting outside to have their packages received and signed for. He then pulled out a camera, and took a picture of the scene.

My curiosity was aroused, so I asked him why he wanted the picture he was taking. His reply was, "When I come back from here to my shop, my boss always bawls me out for taking such a long time with one delivery. So I spent 39 cents for this camera and film to show him why this stop always takes so long." —*Walter Gottlieb, New York City.*

Transparent Photo Case

NEARLY everyone carries a photo or two around in his bill-fold. After a short time the print generally looks pretty seedy. A good way to preserve these treasured pictures is to keep them in little transparent holders. Old cut film is the ideal substance for this purpose. Place the film in very hot water for a few minutes and you will find that the emulsion scrapes off very easily. Let the film dry, and then cut two pieces a little larger than the photo. Bind all four edges with transparent Scotch tape, and the case is complete. This idea can also be used for displaying sample prints, identification cards, Social Security cards, etc.—*F. B. Montange, Portland, Ore.*

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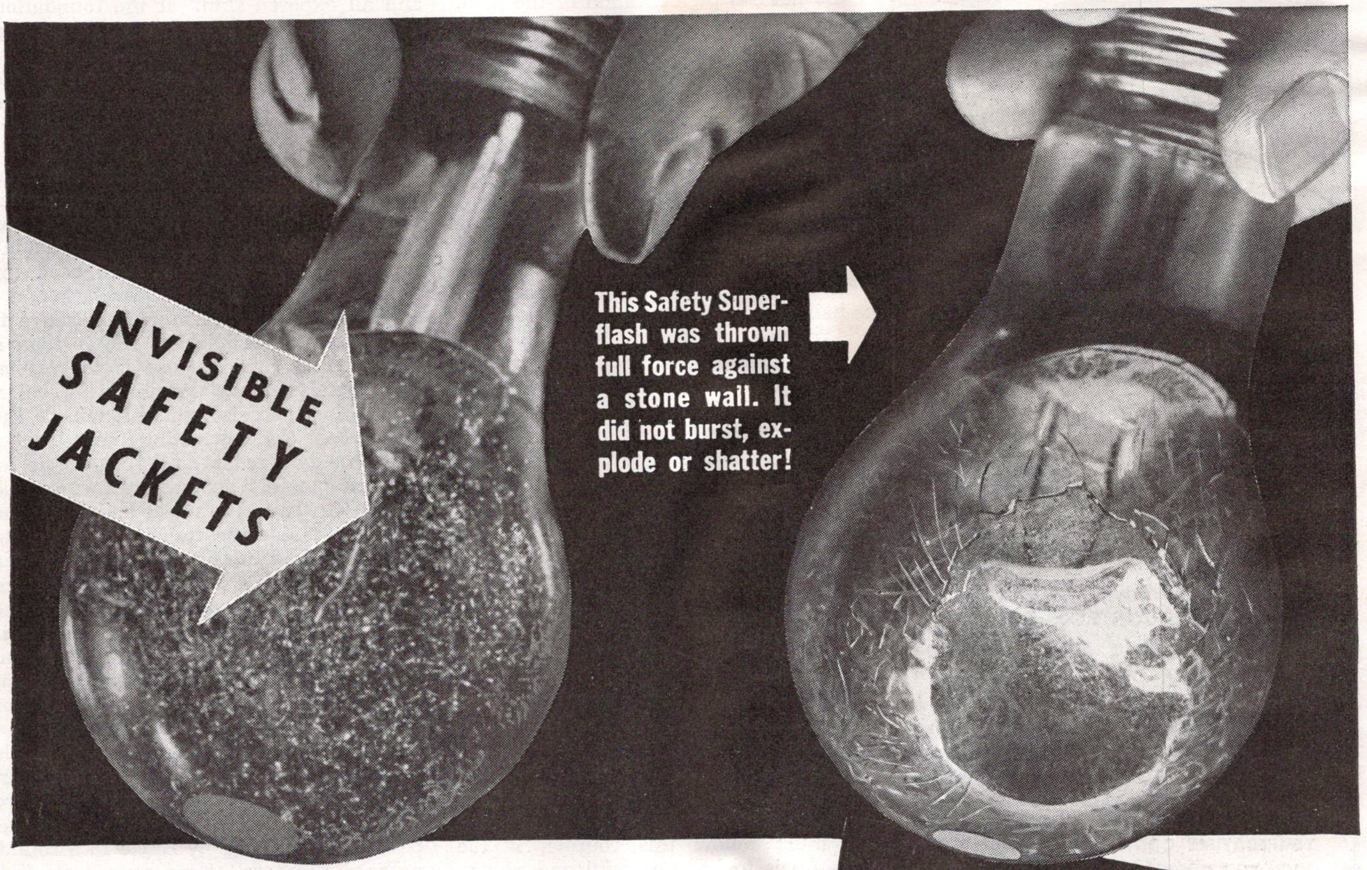

This Safety Superflash was thrown full force against a stone wall. It did not burst, explode or shatter!

New Wabash Superflash Feature Checks Bursting and Shattering — without Holding Back Light!

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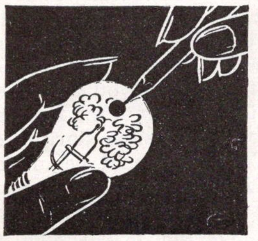
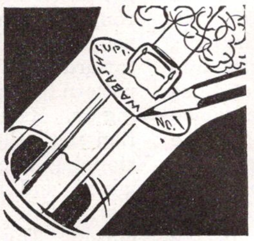
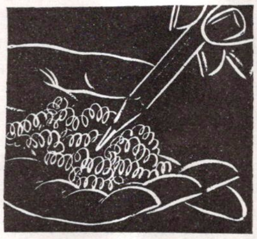


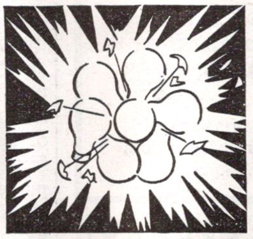
Patented blue "Safety Spot" gives visible check on safety-to-use of every Superflash bulb before you buy and use it!



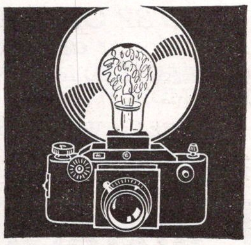
Only wire-filled flash bulb with the Safety Disc—Safety Superflash never gets too hot to unscrew by the neck.



The only flash bulb with the patented all-hydronalium wire flash element that makes flash shooting simple, sure!



"Anti-Contact Flashing" feature prevents accidental ignition of bulbs by electrical power plants, street cars, etc.



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Make-up for Color Is Different

(Continued from page 23)

Care must be taken in selecting and blending the colors so as to compensate for the natural pigmentation of the skin. For example, a light, pale skin will require building up with a darker and warmer flesh-tone. A ruddy or florid complexion is toned down by using a cream flesh-tone. Sallow complexions are built up with warm flesh-tones. Emphasize the natural olive tones of a complexion by building them up with a slightly tan or olive make-up.

Before applying make-up for direct color, it is wise to test both the foundation and powder on the skin. Bind back the hair with a towel or a make-up band, and remove all street make-up with cleansing cream and tissues. Blend the foundation to the desired shade, apply a small patch on the face, blend it well into the skin, powder heavily, and brush the surplus powder off. The combination of foundation and powder should closely match but appear slightly darker and warmer than the natural skin-tone under the lighting used for the photograph. Remove the test patches of make-up with cleansing cream and tissues. Every trace of cold cream and oiliness must be removed from the skin before applying make-up.

All of the cream materials such as foundation, cream rouge, eyeshadow, and lip rouge must be applied *before* the make-up is powdered. Dry rouge, mascara, and body make-up are applied *after* the make-up is powdered. The application must follow this routine, if the make-up is to be successful and photograph naturally.

The foundation is applied in the thinnest possible film. After blending and testing, use the fingertips to apply it in little dabs, until the entire face (including the upper and lower eyelids and the area under the chin) has a freckled appearance. The foundation must be used sparingly, since too much will spoil the make-up and result in a mask-like face. Avoid the temptation to apply too heavy a coating over skin blemishes.

Remove any surplus foundation from the hands and fingers. Dip the fingers into cold water, and with the moist fingertips spread the foundation in a thin, smooth film, blending it into the skin evenly. Keep the fingertips moist during the blending operation. Keep the foundation out of the eyebrows and off the lips. See that it is blended smoothly into the hair line, around the eyes, in the corners of the eyes, around the nostrils, under the tip of the nose, under the chin, and on the neck, fading it away into nothing on the back of the neck and below the neckline. If a low-necked gown or sports clothes are to be worn, stop the foundation under the chin. Then after powdering apply body make-up to the neck, ears, arms, hands, and all other exposed flesh which will show in the photograph.

Helena Rubenstein's liquid make-up foundation is applied with a pad of cotton squeezed out of cold water, saturated with the lotion, and dabbed over the face and all exposed skin. If the foundation streaks, moisten it with a pad of damp cotton and blend it with the fingers.

Cream or moist rouge is better to use than dry or cake rouge. It is easier to blend into the foundation and appears more natural in the photograph. As it is impossible to obtain the correct shades in some brands of make-up, dry rouge must then be used. Lip rouge can be used for cream rouge over a grease paint foundation. The dry rouge is then used for touch-up purposes after powdering.

It must be kept in mind that rouge is first of all an eradicator, rather than a builder. Its primary use is to remove contour. Its secondary use is for color. By placing the color where it will do the most good (by distracting the attention from the bad points and focusing it on the better points), the entire face can be reshaped. Thus, the wider and fuller the face, the closer the rouge is brought to the nose. The thinner and narrower the face, the further the rouge is placed from the nose, back on the cheeks. The shorter the face, the higher the rouge is worn. The longer the face, the lower on the cheek it is carried. A *very light* tint of rouge on the tip of a prominent or pointed chin will help subdue it.

The drawings accompanying this article show the rouge patterns for oval, angular, and round faces. Oval rouge patterns are softer and more flattering than triangular patterns. Never apply rouge in a round, polka-dot pattern. Keep rouge out of all hollows in the cheeks, as it will only accentuate them. Keep rouge outside and away from the laugh lines at the sides of the nose. Rouge placed inside or too near these lines produces an aged and haggard appearance. The brightest spot of rouge should lie on the highest part of the cheek-bone, or on the raised part of the cheek when the person smiles.

There are five important things to remember in handling rouge: 1. It is better to have too little than too much. 2. It is easier to apply more than remove some. 3. Rouge must balance on both cheeks in pattern as well as in intensity. 4. Cream, dry, and lip rouge must match in color and tonal value, if the harmony of the make-up is to be retained. 5. Use *only* red-orange tones of rouge in color transparency work.

Using a fingertip, place the rouge on the cheek-bones. Clean the fingers of all rouge. With *clean* fingertips blend the rouge upward and outward, and inward toward the nose, following the proper pattern for the type of face you are working on. Blend the edges into the foundation until there is no visible starting or stopping line. Rouge should begin nowhere and end nowhere, coming to a warm glow on the highest part of the cheek. Touch up the bright spot of rouge on each cheek-bone by adding more rouge, if necessary. Carefully check the application to see that the pattern and

Bass Bargaingram

VOL. 29, NO. 9 CHICAGO, ILL. OCTOBER, 1939

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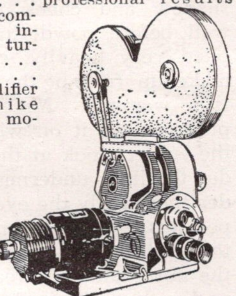

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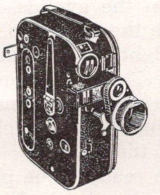

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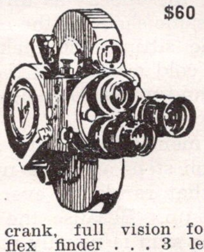

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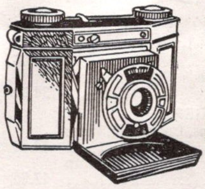

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tone match on both cheeks. Cream rouge "powders down" two or three shades lighter than it appears before the powder is applied. This must be kept in mind when touching up the bright spot of rouge.

When lip rouge is used for the cheeks, apply it as cream rouge is applied and blend with the fingertips. If the rouge does not blend easily, apply *a little* cold cream to the fingers.

Dry or cake rouge is applied *after* the make-up has been powdered. It is easiest applied with a pad of absorbent cotton. Rub the cotton on the cake of rouge and apply it to the cheek-bones. Use a fresh pad of cotton to blend the edges softly into the powdered foundation, following the directions for blending cream rouge. Go over the rouge with clean fingertips. Apply powder over the edges to blend them well into the foundation without a line.

Infinite care must be exercised in using eyeshadow (or "liner"), if it is to serve its purpose and photograph naturally. Brown is the best and safest color to use. Use the finger to apply a *small* amount of the color to the eyelid, blending it smoothly over the entire lid with an upward and outward stroke. The darkest tone of shadow should lie on the eyelid itself, fading into a lighter tone as it nears the brow, and into nothing beyond the outer corner of the eye. Do not get the shadow too dark or it will look artificial. If the eyes are deeply set, omit eyeshadow.

The eyes are defined with the brown make-up pencil, or color from it applied with a narrow make-up brush. Rub the pencil across the back of the hand, depositing color there. Dip the bristles of the brush into cold cream and work a *small* amount of cream into the brush. Take up the color from the pencil with the brush, try it on a clean part of the hand until the desired tone is obtained, then line underneath the eyes with it. If the make-up pencil is used, sharpen it to a fine point and dip it into cold water to set the wax. Have the subject look at the ceiling, then draw a *thin, light line* along the lower eyelid with the pencil or make-up brush.

Start the line just beyond the tear duct, where the lashes begin to grow. Carry the line close to the lashes, following the natural outline of the eye to the point where the eye curves up. *Do not carry the line up with the curve of the eye;* carry it out straight and extend it about 3/8" beyond the outer corner of the eye. Then bring a line down from the *edge* of the upper lid to meet this line. The lines converge at a point level with the outer corner of the eye, and beyond it. Blend the lines with the finger into the softest of shadows. If the lines are not blended they will look hard, theatrical, and unnatural. Never use black for these lines.

It is usually advisable to allow a woman to make up her own brows with the pencil. Most women are adept at this. Care must be taken that the color used to darken them closely matches the natural coloring of the brows or the hair. Often it is necessary to blend color from the black and brown pencils to obtain a perfect match. When this is necessary, apply color from both pencils to the back of the hand, blend the colors together with the make-up brush, and try the tone of the color on the hand before applying it to the brow. Follow the natural shape and curve of the brow and elongate it slightly, tapering it to a point.

A woman can often do a better make-up job on her lips than the photographer can. It is advisable to allow her to make them up *after the make-up is powdered.* A cleaner, sharper outline will be obtained if the rouge is applied with a brush. Work a *small amount* of cold cream into the lip brush. Apply lip rouge to the back of the hand from the stick. Work the rouge into the brush. Cleanse the lips of all foundation with a tissue. Have the subject open her mouth and make up the lips with the brush, then blot the lips on a tissue. If the lips are thin, carry the rouge up over the lip line slightly, to make them appear fuller. Do not powder the lip rouge for a woman, but always powder a man's lips.

Check the make-up carefully for smudges and smears; see that both eyeshadow and cheek rouge are blended well before powdering. Powder is applied very heavily, covering the entire make-up (except the lips, if the subject is a woman). *Never rub* powder on; press or pat it on with the puff. Have the subject look at the ceiling and powder the lines underneath the eyes. Powder thoroughly the eyeshadow on the upper lids, the eye corners near the nose, the eyebrows, the creases at the sides of the nose, and the areas around the ears, under the chin, and down on the neck.

Remove powder from the brows with an eyebrow brush. Have the subject remove any powder from the eyelashes with moist fingers, and mascara them. The photographer is not advised to attempt to mascara a woman's lashes. It is a tricky job, and painful to the subject should mascara get into the eye.

The hair should be combed and brilliantine applied to it, preferably with an atomizer. Touch up the lips with rouge, if necessary. Pat a thin film of cold cream or olive oil on the eyelids, being careful not to smudge the make-up. This produces a soft highlight which is flattering to a woman's eyes. Oil or cream applied to the lips in the same manner will catch flattering highlights which enhance the beauty of the mouth.

The subject is then ready to be photographed. If, after she is under the lights, the rouge appears too light, apply dry rouge to the cheeks as directed above, using the same shade as the cream rouge. After the sitting, the make-up is removed with cold cream and tissues. Wash with soap and water to remove all traces of the make-up.

Make-up for men follows the same general application steps as make-up for women, except that rarely, if ever, are the lashes made up. Because the pigmentation of male skin is usually darker than that of female skin, being more on the tan or olive side, avoid all light cream, pink, or light flesh tones. Keep the male make-up on the tan or olive

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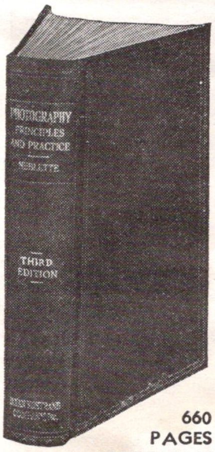

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side. If a peaches-and-cream make-up (which is so effective on a light blonde woman) is used on a man—even though he be blond with a fair skin—he will look effeminate and photograph that way.

Rouge should be employed very carefully with male subjects, just enough being used to give a slight suffusion of color to the cheeks. Keep the brightest spots of rouge on the cheek-bones. Do not attempt to use rouge patterns on the male, and use only a red-orange tint. The Technicolor rouges—Arden's No. 2 and Factor's Dark—are excellent shades for all dark men. Arden's No. 1 and Factor's Light are best for light men, men with white hair, and boys.

Eyeshadow must be applied *very* sparingly and very subtly. Often it is not necessary to use eyeshadow, particularly if the eyes are deeply set, or when a dark suntan make-up is applied. Never line underneath a man's eyes for color photography.

Rarely is it necessary to do anything to a man's brows except brush the make-up from them with an eyebrow brush.

Lighting for color should be well balanced, of one type, and as fast as possible. The contrasts created in color photographs are by colors, not by highlights and shadows as in black-and-white pictures. Make-up for photographic lights should be slightly darker and "warmer" than that used for sunlight. When the model wears dark-colored clothing, the make-up should be slightly darker than when light colors are worn, thus avoiding extreme contrasts. In photographing models out of doors actively engaged in sports, or in sports clothes, suit the make-up to the occasion and give all of the exposed skin a healthy suntan.

Before attempting to use make-up, the photographer should make a number of experimental photographs so as to learn the make-up requirements of his process and its peculiarity in recording make-up colors. Apply a make-up as directed above to one-half of a woman's face, leaving her normal street make-up on the other half, and photograph the result for comparison. This is the best and least expensive method of testing make-up for both men and women. Such experiments will teach the photographer much of value regarding his process and the relation of make-up to it. The trial-and-error method is the best and most effective of instructors.

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Helena Rubenstein's Make-up

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3	Photochrome Make-up Foundations: Light, Medium, and Dark, @ $1.50 each	$ 4.50
3	Powders: Mauresque, Champagne Rose, and Terra Cotta, @ $1.00 each	3.00
2	Cream rouge: Chinese Red, and Red Geranium, @ $1.00 each	2.00
2	Dry rouge: Chinese Red, and Red Geranium, @ $1.00 each	2.00
2	Lipsticks: Chinese Red, and Red Geranium, @ $1.00 each	2.00
1	Eyeshadow: Dark Brown	1.00
2	Eyebrow pencils: black, and brown, @ 50c each	1.00
2	Mascara: black, and brown, @ $1.00 each	2.00
1	Cleansing cream	1.00
	Total	$18.50

Elizabeth Arden's Screen-Stage Make-up

Quantity		*Price*
6	Foundations: Nos. 2, 7 (Panchromatic scale); 3x Pink, 5x Ivory, 6x Flesh and 9xx Olive (Stage), @ $1.00 each	$ 6.00
3	Powders: Nos. 3xx Light Flesh, 5xx Tan, and 10x Special Rachel, @ $1.00 each	3.00
1	Dry rouge: No. 54 Orange Red	1.00
3	Lip rouges: No. 54, Technicolor Nos. 1 and 2, @ $1.00 each	3.00
1	Liner (eyeshadow), No. 2 Dark Brown	1.00
2	Make-up pencils: black and brown, @ 50c each	1.00
2	Mascara: black and brown, @ $1.25 each	2.50
1	Liquid make-up remover	1.00
1	Powder brush	1.00
2	Make-up brushes: Nos. 3 and 5, @ 50c each	1.00
	Total	$20.50

Max Factor's Theatrical Make-up

6	Foundations: Nos. 22, 26 (Panchromatic scale); 4A Special Cream, 5½ Orange, 5A Olive and 7 Spanish (Stage), @ 50c each	$ 3.00
3	Powders: Nos. 22, 7R Rachel and 8 Outdoor Neutral, @ 50c each	1.50
3	Dry rouges: Blondeen, Technicolor Light and Dark, @ 50c each	1.50
3	Lip rouges: No. 1 Light, Technicolor Light and Dark, @ 35c each	1.05
1	Liner (eyeshadow): No. 22 Dark Brown	.25
2	Make-up pencils: black, and brown, @ 50c each	1.00
2	Mascara: black, and brown, @ 50c each	1.00
1	Pound of cold cream	.75
1	Powder brush	1.00
2	Make-up brushes: Nos. ¼ and ⅜, @ 25c each	.50
4	Liquid body make-up: Nos. 22, 26 (Panchro) 5A Olive, and 7 Spanish, @ $1.00 each	4.00
	Total	$15.55

Miner's Theatrical Make-up
(In Tubes and Tins)

5	Foundations: Nos. 3 Peach, 4 Light Juvenile, 10 Rachel, 12 Olive, and 13 Suntan, @ 50c each	$ 2.50
3	Powders: Nos. 3 Peach, 10 Rachel, and 13 Suntan, @ 50c each	1.50
3	Dry rouges: Blonde, Tangerine, and No. 18, @ 35c each	1.05
3	Lip rouges: Light, Medium, and Raspberry, @ 50c each	1.50
1	Liner (eyeshadow): Foto No. 2 Dark Brown	.25
2	Make-up pencils: black, and brown, @ 25c each	.50
2	Mascara: black, and brown, @ 50c each	1.00
1	Pound of cold cream	1.00
1	Powder brush	.75
3	Liquid make-up: Rachel, Brunet, and Suntan, @ 25c each	.75
	Total	$10.80

Stein's Theatrical Make-up
(In Tubes and Tins)

6	Foundations: Nos. 3½ Deeper Flesh, 5 Ivory Yellow, 7 Olive, 21 Peach Bloom, 23 Brunet, and 24 Suntan, @ 50c each	$ 3.00
3	Powders: Nos. 5 Brunet, 7 Cream, and 8 Tan, @ 50c each	1.50
3	Dry rouges: Nos. 18, 5 Youth Blush, and 14 Twilight, @ 35c each	1.50
3	Lip rouges: Nos. 1 Twilight, 2 Light, and 5 Youth Blush, @ 50c each	1.50
1	Liner (eyeshadow): Cinema No. 2 Dark Brown	.25
2	Eyebrow pencils: black, and brown, @ 25c each	.50
2	Mascara: black, and brown, @ 50c each	1.00
1	Pound of cold cream	.85
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Snap Men as They Are

(*Continued from page 27*)

Crowninshield who allowed me to shoot him on the side of a sand trap. He is an art critic and writer known the country over. His wit is ready and his after dinner remarks are often quoted. And so it goes, with one celebrity after another. I've followed them in many places all over the land. Over golf courses, sunlit beaches, on top of New York's silhouetted roofs, and in the oddest poses imaginable. Men like Dean Cornwell, mural painter and illustrator; editors like Sumner Blossom, of the *American Magazine,* and William Frederick Bigelow, of *Good Housekeeping;* John Golden, theatrical producer, song writer, and author; Frederic Newlin Price, the boss of the Feragil Galleries; Rube Goldberg, cartoonist and humorist; John LaGatta, illustrator; James Montgomery Flagg, a familiar name to everyone; Steve Hannagan, publicity director, the man who put Puerto Rico and Sun Valley on the map; Sid L. Hydeman, art director of *Redbook.* Then I hunted down Richards Vidmer, Otto Soglow (the little King), and Kyohei Inukai, the Japanese portrait painter. There are many, many more of them and every one an adventure. A thrill was packed in every push of the button.

Almost invariably, the first questions I am asked concerning my portraits are: "What camera did you use?"—"What kind of a lens?"—"Do you use a filter?"—"Are they taken indoors or out?"

These questions are as amusing as those often asked of an artist. Such as, "What kind of canvas do you use?"—"Do you prefer sable or bristle brushes?"

Of course, tools are important. Not the *best* tools, necessarily, but the best you can find, or afford.

What is a portrait, anyhow? Is it the result of a combination of Rubens brushes, Winsor and Newton paints, plus a sloshing of pigment all over a 40x50 canvas? Similarly, is a photograph the composite results of an Exakta with an *f* 2 Zeiss Biotar, or an *f* 2.8 Zeiss Tessar; a Contax with a bag of beautifully ground Zeiss lenses, focal this and that, plus the finest chemicals, darkrooms, and a full quota of printing papers? (I forgot to mention Leicas, Kodaks, Rolleiflexes, or what have you!) If these alone can create a masterpiece why are there so few good photographic portraits and so many bad ones?

Painters, as a rule, hold up their hands in horror to me when the word camera is mentioned. "For God's sake, old man," they cry (if you happen also to be a painter, as I am), "don't be enslaved by that damn thing! Stick to your models, draw from living figures, throw out that sinister mechanical influence—the camera."

A real artist is conscious only of the result which his mind hopes to project into being. If he stupidly draws the model with record-breaking authenticity, *he, perhaps,* has *something*—but it isn't art, not by a long shot! He's, so to speak, a "stooge" with no more right to be called an artist than a parrot has to be credited with a rational brain. And the same goes for the camera.

And here is a little advice! Always place your model in such a way that the eyes show up best; move him this way or that to get his nose in a favorable, Barrymore-like pose; soft focus or retouch the face, so that the horrid wrinkles will disappear. What have you now? A *mask?* Well, let's not be too critical. A very lovely, and I *do* mean lovely, representation of a man. But who is he, anyhow?

The picture does remind us, of course, of the person who, evidently, sat for it. His wife will adore it. Why? Because, "Henry looks so handsome in it. Quite a young-looking man—hardly a day over thirty!"

Very fine for a man of fifty who, from the first day he rolled up his sleeves, has given life a tough battle. The kind of man who asked for no quarter, fought his way to the top through sheer character and grit, and is now paraded like a chorus boy because his wife does not want him to look rough or any part of the real person he actually is.

I like to photograph *men,* not masks of men. I hang on to the character which my sitters have fought for and earned.

I try always to *get my man.* To catch that something that everyone recognizes, the spirit poking out of the flesh and bone, the free soul as it lives in its physical body. I doubt very much whether the beautiful ladies who are the wives and sweethearts of my subjects will like me, or my frankly truthful portraits. Perhaps some of them who are not too confused by the turn of a nose or some other physical imperfection, will recognize that, in the twisted shapes we call eyes, noses, and mouths, we find imbedded true records of deeds that have been done, battles that have been won or lost. Every little wrinkle marks an adventure on the path to glory.

There is nothing more beautiful than a face which is old in time, lined and seamed by wind and sun, tortured or glorified by life. Every line and wrinkle, like a new road in an uncharted country, points to success or failure. The imprint is there for those who have eyes to see.

I doubt very much whether any man would go to a photographer unless he were pushed to it. When he does go it is usually because wife, mother, or sweetheart literally drags him there. When taking a picture under such circumstances, the photographer, because of a series of painful reminders, knows that the thing to do is to produce, by any means the darkroom or the retoucher's art can command, a shadowy replica of Clark Gable, Tyrone Power, or Bob Taylor. Therefore he plays with the lights and the position of the sitter in order to create some semblance of what he thinks might produce glamour. Perhaps he is one of those beaten boys who, from countless shocks, is reduced to the dismal depths of what could be called,

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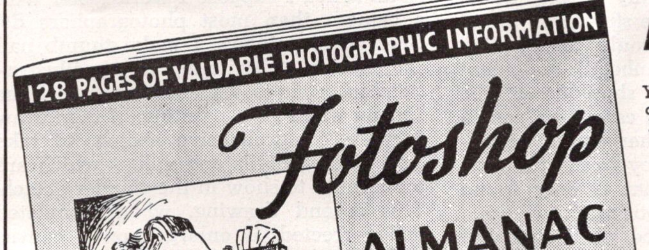

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"Lighting and Time Formula, No. 1, or No. 2." After that he sneaks into the darkroom and attacks the hopeless task of knocking off twenty of his hero's years, so that he will look like the beautiful young Boy Scout which he certainly is not.

Women do not realize that they are responsible for this sad state of affairs. It never occurs to them that they do this because they have been trained and educated to dodge practically everything in life that is natural. Every girl likes what she calls illusion. She can walk into the stores, anywhere, and get her nail polish, lip rouge, and all kinds of make-up. She can run into any one of a dozen shops and sally forth with a newly upholstered upper structure that will make the male population agog with admiration. She can drop into a near-by hairdresser's and come out with her naturally mouse-brown hair a gorgeous mass of honey-colored curls. From tip to toe, she defies the laws of nature. She is, she thinks, the *Grande Illusion.*

And she uses much the same reasoning when she goes to a photographic studio. And, in the same way, when she takes her husband or sweetheart to the photographer's, she wants the picture to conform to her mental concept of a glamourous hero, *sans* lines and *sans* character. Is it any wonder that the poor man hates the idea of going to a photographer's almost as much as he fears going to his dentist?

Naturally, a man does not care to have his wife, or his friends think of him as "old." In this country we sometimes use this adjective in the same category with "feeble," "impotent," or "on the down grade," whether mentally or physically. As a matter of fact, we should be proud of middle-age. It should signify the height of intelligent manhood. Judgment does not sit upon the shoulders of the too young. Experience cannot be passed along to others. Neither can it be acquired from books, or by word of mouth. It is a Shangri-La that is only found after a long and arduous trail.

A young man may be intellectual but not at all intelligent. Wisdom waits until its value is understood. So, why, in heaven's name, should we wish to usurp the mantle of the uninitiated, the yearling who is just learning to think intelligently? Let's revalue ourselves. Let's look at things straight and without fear. Let's be proud of what we are, or what we are to become.

If you really wish to take stock of yourself, go to an honest photographer and put him to work. Tell him you want a truthful job; no tricks, no retouching. Take the picture home with you. Look over this fellow, the man your wife prefers not to know. Check on him carefully. Is he the man you really are? Does the record in his face bear scrutiny? It is *your* face. Remember, yours to remold if the need must be. The photographer should not, and cannot do it for you. Certainly, this is an angle worth remembering.

Now knowing a good deal more about the technique necessary in becoming a full-fledged or graduate photographer, I am a little more eligible as an expert. But I will not bore you with details concerning refraction of light, or its path as it travels through the various elements of a modern color-corrected lens. Nor will I take you into the darkroom and tell you the best way to arrive at the best results, or the best papers to use. No doubt you all have your own pet papers and pet methods and you probably get just the results you wish from them.

A reasonable process of deduction suggests that each individual must be dealt with separately. But how? What has John So-and-so got that Harry So-and-so has not, or vice versa? We might go to our favorite astrologer or numerologist and ask him, but he probably wouldn't know. We could tell John or Harry that he is allergic to Panatomic-X —allergic is such a wonderful word. At least this would give us time to think up a better excuse. Yes, that's it! We painter-photographers haven't taken the time to make up a list of good sure-fire alibis; to learn how to be nonchalant in case an embarrassing situation arises with a client.

But, to be serious. I feel that the camera is not a mere mechanical instrument. It is a bridge to help us span the way to poetry, drama, and portraiture. We have not begun to scratch the surface of its possibilities. The limitations from which photographers suffer are only relative. The same limitations close in on the writers, poets, and painters. Pictures are created in the *mind* first, and then appear on the negative. Any other way is pure guess work.

Because I have had years of training as an artist, I suppose I work faster with a camera than most photographers do. Like other painters, I make thumb nail sketches as a beginning to my illustrations in order to visualize a composition. I mean when I am painting. I then draw a more comprehensive sketch, to take care of the details and values which are too minute to show in the smaller sketch. This second drawing, when completed and corrected, is enlarged on a canvas and the painting is then under way. You can readily see how tremendously important the sketch is; how absolutely lost I, or any artist, would be without it. And precisely the same holds true in photography. A few careful sketches before hand will eliminate all the guesswork.

Well . . . well, at this point, I come to an abrupt halt. All I can add—whether to painters or photographers (or the two combined), is Cheerio, God help you and good luck!—

An Emergency Funnel

A TEMPORARY funnel can be made by tearing a corner out of an empty photographic printing paper envelope, and then tearing off the flap. Use as you would an ordinary funnel, holding it with one hand, pouring into it with the other. The funnel will not need to be washed afterward, as it can be thrown away. I use such a funnel to pour hypo crystals down a small-mouth bottle when mixing the fixing solution.—*Morris Dollens, St. Paul, Minn.*

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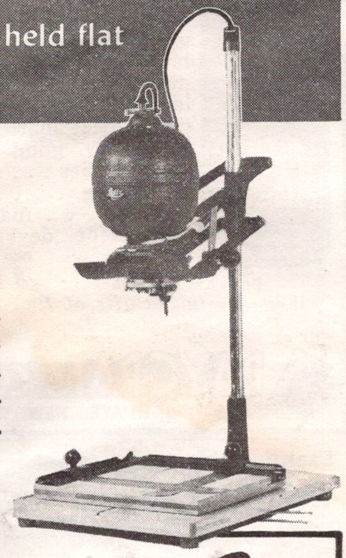

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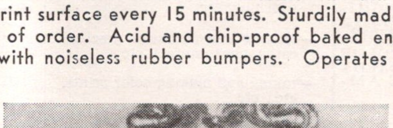

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Debunking Spirits with Infra-Red

(*Continued from page 16*)

The argument is ingenious but not difficult to dispose of. Our optic nerve reaches the limit of sensitivity in the red end of the spectrum at 7,600 Angstrom Units (used for measuring the wavelength of light, one unit being the equivalent of one ten millionth of a millimetre). The sensitivity of the infra-red plate begins at 6,600 A. U., rises to its maximum at 8,000 A. U., and declines to a minimum at 9,000 A. U. A great deal of the energy used for the exposure is, therefore, within the visible region. Precise calculations might perhaps show that strictly by infra-red we would not be able to make a serviceable exposure at all. If, then, the psychic structure is visible to us in red light a trace of it, even though underexposed, should be discoverable on the infra-red plate.

A second and much better argument is this: why should mediumistic structures reflect red and infra-red rays at all? Can it not be that they are transparent to them and only reflect the shorter waves in the ultra-violet region?

The first and obvious answer is that whenever visual observation is permitted in the seance room, red light is being used. Whether the phenomena are due to normal or supernormal causes, our optic nerves respond to them in this light. But this does not quite settle the question. We all have heard of accidental "ghost photographs" secured when nothing was visible to the human eye. The limit of our vision in the ultra-violet end of the spectrum is 4,000 A. U. But any ordinary lens transmits ultra-violet down to 3,400 A. U. and the average plate, particularly the panchromatic and Golden Izo-Zenith, is sensitive to this wavelength. It follows that if a ghost exists objectively, it must needs impress the plate from the ultra-violet end of the spectrum (the ordinary plate being insensitive to infra-red). Should one, therefore, pay more attention to photography by ultra-violet than by infra-red?

The answer is, *not necessarily.* It is possible to take photographs on an infra-red plate in the violet end of the spectrum. It happens that the infra-red plate has a second sensitivity curve which begins beyond 4,000 A. U. and reaches to 3,300 A. U., 100 A. U. lower than the glass lens can transmit. Provided there is illumination by ultra-violet, or the psychic structure is self-luminous in the ultra-violet end of the spectrum, an infra-red plate is capable of detecting the presence of a ghost. Ultra-violet illumination can always be provided by a second sychronized flashlight box which has an ultra-violet filter in front, and if one exposes the film through a quartz lens simultaneously with others, one might secure a photograph of a psychic structure in the wave band of 3,400-3,300 A. U. which an ordinary lens would miss.

One final word as to the actual difficulties that one has to overcome in taking photographs in the dark. It is well to use hypersensitized infra-red plates or films. But with such material careful handling is necessary. The hypersensitivity usually wears off in 2-3 days whereas the ordinary infra-red plate may remain fresh for 2-3 months. One must also keep in mind that infra-red plates have a chemical focus. This varies with the lens. With a glass lens one has to focus about 5″ in front of the vital spot, with quartz lens about a foot. With several cameras at various distances the photographic set-up takes considerable time. There may be several leads to the flashlight boxes (from instruments, from the medium, and from the director of the experiments). All of these have to be tested in advance. Then, in the dark, one must be ready to change plates and flashlight bulbs as quickly and noiselessly as possible and find one's way unerringly to the various cameras. This may not sound too complicated but when four or five cameras are in use there is a handful to do and to think about. The change of flashlight bulbs was facilitated by a revolving flashlight wheel which had a dozen bulbs set in it and ready for use. The change was affected by moving a handle at the back, and the position of the handle was indicated by luminous dots. Practice has made me master of the situation and there were occasions when I made from thirty to thirty-five exposures in a single sitting without a hitch.—■

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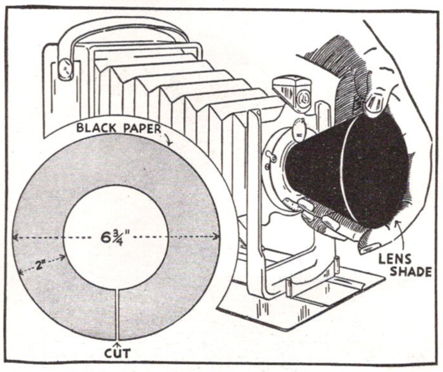

Drawing shows how shade is cut and how it slips on over lens.

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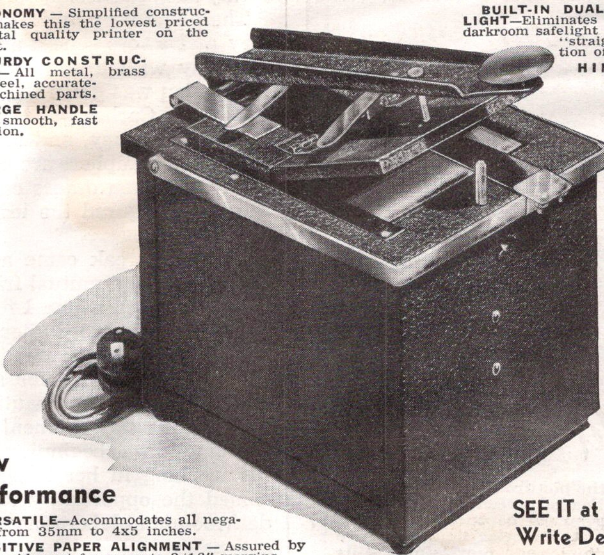

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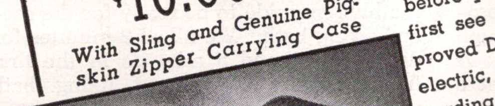

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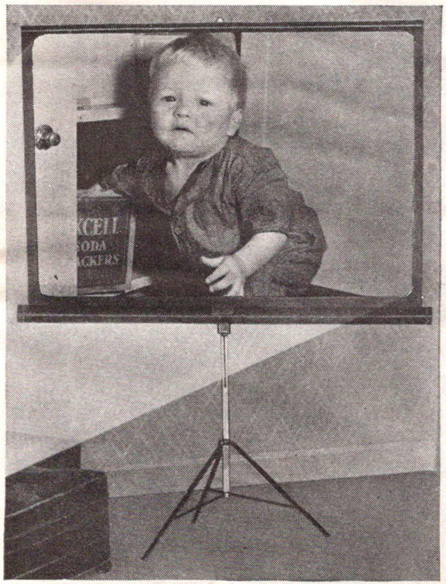

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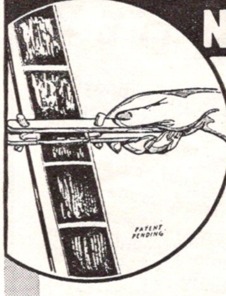

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Color Meets the Deadline

(Continued from page 25)

and in the hands of a few professionals—way back in 1936!

There had been built up a certain mystery and awesomeness about color photography with a one-shot camera. The impression was given that it took a week to make a Carbro print, as well as scads of genius, money, and luck. But newspaper photographers are notoriously foolhardy, so when orders came to start the Studio we figured the least we could do was try.

A lucky break came at the very beginning when a mutual friend introduced me to Al Gras, whom I firmly believe to be the best Carbro printer in the country. Al had been experimenting with color prints on his own ever since 1923. He showed me a set of beautiful 5 x 7's he'd made in his own kitchen! His long-suffering wife was beginning to rebel against his working in her kitchen, so he welcomed the opportunity to help set up a darkroom and laboratory away from pots and pans.

We began our work without even a color camera, using an ordinary plate camera with filters to get the color separations. Results from still lives were encouraging. A human victim seemed the next step. Since at first our model had to sit immovable for at least 25 seconds, we alarmed Chicago studios by asking them to help us find an old-fashioned head brace of the sort used for grandpa's portrait when he still had his teeth and sported a handlebar moustache.

It took four men to make that first *Tribune* color photo of a live model. One changed filters, one slapped plates into place, a third operated the shutter, and a fourth cooed soothing words of encouragement. To our amazement, and to the astonishment of the professionals who had come to scoff at the results, the finished photograph was not at all bad.

We bought our first color camera then. Today we have several. During the time the studio has been in operation we've wiped out many false illusions about the difficulty and time-absorption of color photography. Our studio found that an air-conditioned laboratory is not absolutely necessary for color work, although it helps. Any competent amateur knows how to keep his working solutions at a reasonably accurate temperature, and a variation of just a few degrees is not alarming.

Many expensive materials once required for color photography are no longer a necessity. One-shot cameras are now in the price range of the better miniatures. Our studio replaced the high-priced "dope," which was used for cleaning celluloid plates, with an ordinary household cleansing powder. We don't use fine cloth for swabbing the prints; we use ordinary facial cleansing tissues. A reasonable amount of ingenuity exercised in the selection and improvisation of equipment has saved us several hundreds of dollars.

The color materials in use today differ considerably from those used a year or two ago, and are much more easily controlled. The pigment-bearing paper is much better than the readily frilled tissue we used formerly. Much less patience and delicacy are now required than were necessary when we began our work.

Color photography's greatest advancement, however, has been in the telescoping of time required to make a color print. Carbros are only a matter of a few hours, even for the amateur who has had limited experience. And the work of making one or several prints may be broken up into several periods. We are particularly fond of Carbro because of its comparative simplicity, the high quality prints it produces, and the fact that it is the least expensive of all color printing methods.

A few tips from Al Gras may be in order for the amateur color photographer who is making his own prints from separation negatives. It takes only about 5 hours for a reasonably competent technician to run through all stages, from the developing of a set of plates to the drying of the color print on the permanent support.

As preliminary precautions, we always clean and wax celluloid plates after use so that they will be ready in case of an emergency, and we cut some pigment papers to the proper size. It takes about 15 minutes to develop a set of plates and 15 more for fixing. While the plates are being processed we lay out trays for the bromide prints and prepare our chemicals.

Using plates wet in an open frame we make the bromide exposures for the blue plates. This saves approximately 2 hours drying time. We usually require 2 blue exposures to make certain of our accuracy, and we sometimes take 3. We find that no sharpness is gained in this work by stopping the lens down excessively, so it is usually kept at *f* 8. The first test exposures are seldom developed to the finish unless they come up in 10 or 15 seconds, which holds promise of a correct exposure. It takes about 10 minutes for the blue bromide to be ready for the second fixing bath. We allow 2 minutes for development and 5 minutes in the first fixing bath. The second fixing bath works for 10 minutes.

A gray scale included in the frame helps when we match the second (the red) print with the blue bromide. If no grey scale was used, we use a neutral spot in the picture, such as a white handkerchief, for the key. Bromides that match well are a fetish in our studio. Good bromide prints are the most important links in the Carbro process. We have found that Velour Black "N" paper gives us firmest control over the degree of softness or contrast in the print. This is a single-weight paper, in which the grain all runs the same way. The type we use is made especially for Carbro work. However, any good bromide paper can be used for Carbro printing. Many studios use single-weight Illingsworth De Luxe.

Surface similarity isn't as important as the depth of the silver deposit in matching bromides and giving brilliance to the finished color print. Therefore all three bromides are developed at the same temperature for the same period of time and in the same strength developer.

The yellow bromide is matched to the red, their developing time naturally overlapping. It would take a slow worker an hour to print, develop, and fix all three bromides. Each is washed individually in eight changes of water. While the blue bromide is washing, we mix the sensitizing bath for the colored tissues (using the manufacturer's formula), and put them to soak. It takes about 2½ minutes for each tissue to become sensitized.

The three bromide prints are placed in firm contact with their respective sensitized pigment papers by being run through a wringer. It takes about 5 minutes to make each sandwich of pigment, bromide print, and outside celluloid "blanket." After the last, or yellow, sandwich is completed, we trim the pigment and strip the sensitized pigment sheet off the bromide under water which is 60 to 65° F. The bromide prints are then destroyed because the pigment has taken out much of the silver deposit.

A sheet of waxed celluloid is slipped under water where the air can't interfere with the work and the pigment paper is placed in contact with the celluloid. It takes about 2 minutes to squeegee each sheet of paper onto its respective waxed celluloid. When the yellow is on, we soak the temporary support in water so that it will be ready after all three are transferred. (The temporary support is a sheet of thin, white paper.) The order of handling the colors is always the same, blue, first, red, second, and yellow, third.

When the last of the three sheets of pigment is on the celluloid, the first is developed in about 120° water. After this the paper is peeled from the waxed plate, leaving a mass of color adhering to the wax. All of this color washes off except the part which has been acted upon by the silver, which remains as a unit of the finished print.

After the surplus color has been washed off the celluloid we transfer the blue color onto the temporary support. This, like all other transfers in Carbro printing, is done under water to prevent the formation of air bubbles. The wax comes off the celluloid like a gloss print off a waxed ferrotype tin. It takes about 20 minutes for the blue to dry.

After the blue, the red is transferred onto the same temporary support. The squeegeeing is done very carefully. If it is so tight that the red can't be moved a fraction of an inch in order to get good register, the support and the celluloid should be re-soaked, stripped apart, and squeegeed together again. If it is so loose that once the color is in position it doesn't remain there, we wait until it dries more. After registration is attained, we squeegee and roll the color into permanent registration.

The same process is used with the yellow. It takes about 15 minutes for the red to dry, about 10 for the yellow.

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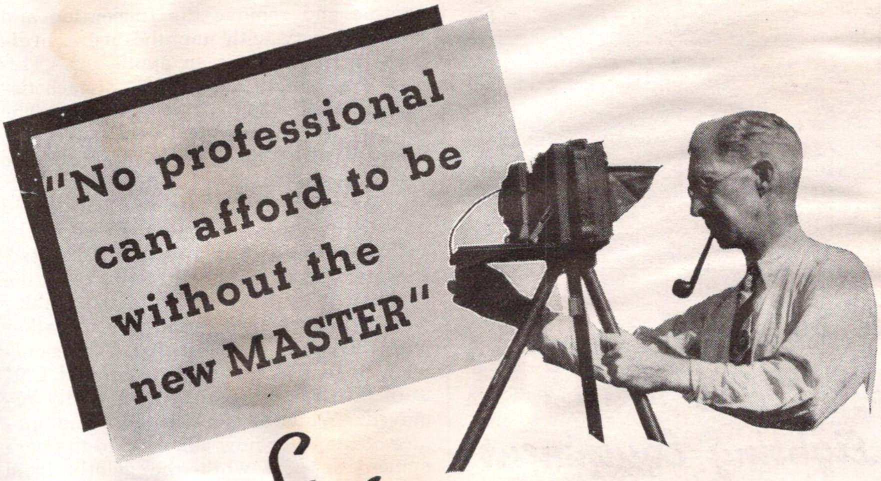

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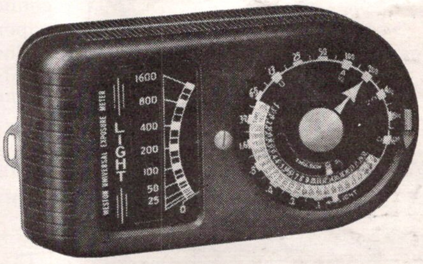

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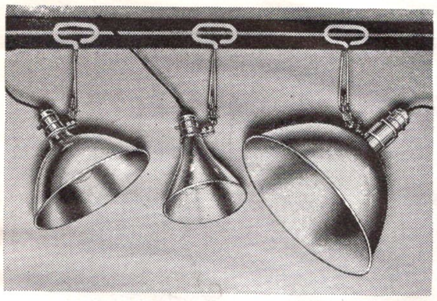

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pentine and remove the turpentine and dissolved wax with naphtha, using ordinary facial tissue as an applicator. This cleansing follows the transfer of each tissue onto the temporary support. The support is soaked in water about 1 minute before each of the second two colors is applied.

After all three colors are transferred onto the temporary support and while the yellow is drying, the final support is soaked in water. The temporary support and the permanent support (a piece of double-weight paper) are squeegeed together with the colors on the inside. The sandwich is soaked in water of around 120° until the temporary support is easily removed. Water is splashed over the surface of the color now adhering to the permanent support while the gelatin from the temporary support is removed and the final print is set to dry preliminary to mounting or whatever ultimate end is to be its fate.

This, in short, is the Carbro printing process as we practice it today. No competent amateur has any reason to be frightened by it. Once a good set of bromides is made, the most difficult part of the work is over. And color photography, separation negatives, and Carbro prints are the natural field for the more progressive amateur photographers.

It's a constantly broadening field in which excitement key-notes the tempo and imagination sets the limitations. And if we can make the process practical in connection with a metropolitan daily paper, it shouldn't be too much for any serious amateur, who may do it at his leisure.

[*The reader may find it helpful to review the detailed description of the Carbro process which appeared in the December 1938 issue of* POPULAR PHOTOGRAPHY. ED.]—▶

Designs with Your Camera

(Continued from page 17)

"You remember the old kaleidoscopes, how they used to show a pretty design when you looked through them, and how the design changed every time you moved them," Schieren said. "Well, that's the principle of my tube. Inside there are four mirrors which pick up and multiply whatever appears before them. The tube is attached to the camera lens—that's where my patent comes in—and really it becomes an extension of the lens, multiplying and merging the original theme so perfectly that in some cases it is almost impossible to tell from the result just which part of it was the original. And, just like a kaleidoscope, the design changes every time the slide, from which the design is made, is moved."

The tube varies in length and size with the focal length and diameter of the camera lens. To date it has been adapted to fit every standard negative from 35mm to 8 x 10, with uniformly excellent results excepting a slight softness in the corners of the square format caused by an optical dead spot where the mirrors are joined. At present, however, Schieren is working with an optical company on the production of a rod which will give identical, needle-sharp results at all points, although a compensating plate for the square tube is now available.

The Schieren Tube, however, is not the only product which its inventor has given to the world of photography. Starting life as the son of a successful business man, his first camera, purchased at the time that cut and roll film were being introduced to a thankful yet slightly credulous world, used roll film and took 100 pictures to each loading. To photographers who for years had been struggling with sloppy wet plates such a camera was unquestionably a gift from heaven, but its young owner found the fact that it had to be returned to Eastman intact for developing and re-loading an irksome matter. As soon as possible he began to do his own developing and printing.

He found the entire process of photography fascinating, and through the years that followed he continued to study and develop his technique. In 1919 he founded his personal photographic business which he continued to operate until 1932 when the death of his oldest brother caused him to return to the business his father had founded. In 1926 he was made an Associate of the Royal Photographic Society of Great Britain.

He has always been ahead of the great majority of photographers. In 1928 he received one of the first miniature cameras to reach America, and, as a result of his work with it, developed and marketed one of the first finegrain developers, "No-Grain." A specialist in pictorial work, many examples of waterfront and ocean pictures, a favorite subject, now hang on the walls of his office.

Schieren's interest in design first arose in 1922 when with a motion picture camera he visited the Grand Canyon and photographed the Kaibab Forest. A problem in creating an interesting title for his film had arisen, and he constructed a reflecting tube to make possible an effect he had been considering for some years.

"It gave me what I wanted," he said, "but the idea kept haunting me after the movie was completed. I didn't quite know what to do about it, until one day in 1928 I thought of adapting a similar tube to a still camera as a means of achieving unusual effects and designs."

Immediately he started work, but countless problems arose to block the path. It was easy enough to construct the first tube, but then it had to be attached to the camera and the practicability of the outfit proven.

At first, working only in his spare time, Schieren tried to make designs directly from natural objects, but the results were disappointing. It was easy enough, he discovered, to create a design from any flat surface such as a drawing that could be copied, but whenever he attempted to take pictures through the tube everything went haywire.

Then one day he happened to be studying some transparencies. An idea came to him, and, "Maybe this is just what I want," he said. Quickly he rigged up his camera and tube over a transparency, placed a light below, made an exposure, and rushed into the laboratory to develop the negative. It was perfect.

From that moment everything went smoothly. The box-like base which holds and illuminates the slide was the logical result of the discovery. Today, after having made hundreds of tests and having worked out an arrangement whereby the tube is able to create a design from either the full area of the standard two-inch slide or any segment thereof, he still uses that system. Further investigation has revealed that it is possible to achieve designs from anything transparent. Papers of all sorts have been tested and found serviceable, tracing cloth, linen, and other material. One of the most fascinating designs that Schieren has yet created was made when he overlapped and photographed the texture of two bits of graph paper.

Color is no deterrent at all. Natural color transparencies may be copied through the tube in full color as easily as in black-and-white. While as for the commercial value of the work, designs resulting from the use of the tube on a miniature camera were accepted and hung beside the products of the best manual designers in the country at the New York Art Center where they received much favorable comment.

Originally Schieren's idea was to perfect an accessory for high grade miniature cameras which might be used to teach the principles of design in art schools, and provide an unfailing source of motifs from which trained designers could work. In that respect he has undoubtedly been successful, but I wanted to know how a photographer who wasn't commercially interested in the field of design could use the tube.

"That's easy," he said with a smile. "I've had more fun in photography since I thought this up than ever before. I get a big thrill out of taking subjects such as buildings and people, material from which it is usually pretty hard to get a design, and see what I can do with them. The results are usually pretty funny. Towers lean toward one another from all angles, and my friends leer at me from all sections of the page."

Man, oh man, I thought. He sure has got something there.—

Drying Bakelite Film Tanks

USERS of the adjustable type bakelite tanks for developing 35 mm and other roll film have probably been faced with the drying problem when two or more rolls had to be developed. Any attempt to thread the film into wet tanks is faced with certain failure and usually results in strong language. These tanks cannot be dried with heat because of the danger of warping, etc. Here is the method I have found satisfactory. First dry the tank, reel, etc., with a towel. Then take a strip of photo blotting paper and run this along the grooves in the reel. This takes off all surface moisture. A very short exposure in front of an electric fan will finish the job. All told, not more than 4 or 5 minutes are needed, and the tank is ready to load again.—*L. W. Nygaard, Gillett, Wis.*

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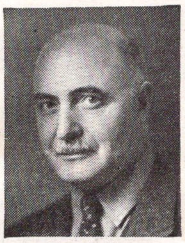
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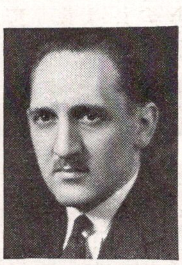
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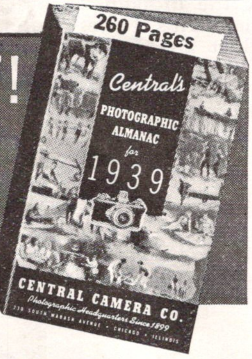
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Cap and Gown

(Continued from page 31)

kept on their toes by a waiting list. Student prints have won prizes in the Florida Federation of Arts at Palm Beach and in the Florida Allied Arts exhibitions. The college use of student work in publications and the year book are incentives to distinguished work.

Turning back to women's colleges, there is Marymount at Tarrytown-on-the-Hudson which this year has shown a forty per cent increase of enrollment in photographic classes. The majority of Marymount girls take the course as a hobby, but an alumna, Molly Lane, conducts her own studio in New York City. The department has full equipment for developing, printing, and enlarging, with a studio equipped for portraiture. Attention is given to the projection of movie films and the principles of motion picture technique. A great many of the students are home movie enthusiasts.

A lot of people are carrying cameras to class these days and New York University has met the increasing popular demand for classes in photography by giving both an elementary and an advanced course. In both groups there are men and women holding important positions, some who are studying for the fun of it and others who hope to become professionals. Some dream of making their way around the world with a camera. Others want to record the development of their children, and still others hope for the ultimate destination of a penthouse atelier.

Whatever the motive, they meet, have fun, and work hard. The elementary classes meet in specially equipped laboratories in the University on Washington Square. This course is designed to fill the needs of those who are interested in a better understanding of equipment, from taking a picture to producing a fine and satisfactory print of pictorial and artistic value. The ground covered is of such a fundamental nature that it applies to photography with all kinds of cameras.

Some of the sessions of the advanced course are held in the studio of H. A. von Behr, photographic illustrator who is a F.R.P.S., to familiarize the group with the operation of a professional studio. Here, with special analysis of professional problems, the students gain rapidly in the techniques that mark the difference between amateurs and professionals.

Another valuable part of the course is available to those who wish to do home work. Mr. von Behr assists in planning the home experiments and gives suggestions and criticism when the results are brought in. Practical advice is offered on what home equipment to buy and designs are worked out for the craftsmen who wish to build their own darkrooms.

The University of Illinois places photography in the Department of Physics and gives the most comprehensive elementary course I have found to date. I present it intact for my readers to digest the best they can.

Here it is:

Photographic equipment and materials.
Emulsion speeds.
Exposure.
Development.
Darkroom technique.
Intensification and reduction.
Light sources and printing processes.
Color photography.
Color sensitivity.
Color filters, infra-red and ultraviolet.
Cinematography.
Stereoscopic Photography.
Photomicrography.
Aerial Photography.

The prerequisites for this course is general physics and the consent of the instructor. The advanced course at Illinois is open only to graduate students.

Other representative college courses are those of the University of California which gives two years of applied photography with laboratory work in the fundamentals of the craft, and the University of Rochester which offers two courses in the Department of Optics. In line with the department, emphasis is placed upon sensitometry and photographic photometry. The advanced course includes the theory of tone reproduction, the structure of the developed image, and color sensitivity. One lecture hour per week and three hours of laboratory are given for a fee of $5.00 per term. Iowa State College demands chemistry as a prerequisite. A course of a practical nature is given with concentrated study of composition and lighting and the corrective treatment of negatives.

News photography came to the front in college circles last January when Washington and Lee University at Lexington, Virginia, sponsored a conference at which three competitions among southern newspapers were held. During the conference, demonstrations of new and improved techniques in photo-journalism, from the taking of the picture to engraving and press reproduction, were enthusiastically attended. Leading experts discussed all the problems of news photography, a field of expanding opportunity and unlimited interest.

The Washington and Lee Camera Club was active in the conference. During the last few years it has advanced so proficiently as an experimental center that the College hopes to offer a course in photography within the year. This club is showing what a hard working group can accomplish that doesn't savor of dilettantism.

Down Missouri way, the staff of the University of Missouri year book has met a crisis. Maybe the picture magazines are responsible, but the staff decided to put out a book that would be largely pictures. The venture was too enormous to finance, so to meet the emergency the staff went for candid photography with a well organized precision. Camera sniping is a favorite sport on the campus and the delightfully (?) frank studies of faculty and students should make for a record subscription.

If you have been thinking of photography as something that youngsters toy with, you would have been sharply disillusioned if you had attended the Second Scholastic Salon of Photography at the

American Museum of Natural History last February. The American Institute of New York City did something inspirational when it started this competition last year. The Institute worked with the cooperation of Junior and Senior High School camera clubs in all sections of the country.

This year 308 expertly mounted and titled prints, representing the work of 170 students, were shown. Prizes and awards were given in three groups: Pictorial, Technical, and Junior. Outstanding New York photographers served as judges. The winners ranged in age from 11 to 18 years. Some of the pictures were so good that I wondered what it avails a photographer to come of age.

It is the teacher's turn to step into the spotlight, and when you have learned the qualifications he must meet to get an appointment in the New York City high schools, you may agree that he has a future, but even more impressive to me, is his past. There are expanding opportunities in this department because, on the inauguration of photographic courses, the demands for registration exceeded the facilities at the Metropolitan Vocational Training High School where the course was first tried out.

William Freese, head of the New York Times Studios, gives the examinations and could tell you a lot about the applicants. Obviously they need all the photographic skills and are professional men. Why are they anxious to turn to teaching? They reason it out in considering their futures and find the advantages on the side of teaching. Presuming they like to associate with young people and have ability to impart what they know, they are sure of an income with increases to a good maximum; no studio rent; Christmas and spring vacations; three summer months when they can follow careers of their own; a better than average job tenure; and pensions upon retirement.

Getting into the New York school system through the door of photography is not easy. Mr. Freese doesn't look on photography as a snap course to be given either by someone with a smattering of knowledge of many phases of the subject, or by an over-specialized teacher.

The first requirement is seven years of varied practical experience. The examinations are demonstration tests covering lighting, knowledge of different kinds of lenses and their applied uses, developing and printing, treatment of various types of subjects, a quizz on all chemical and paper materials used in photographic processing methods, composition, studio work in still life and portraiture, and some knowledge of color work. The candidates are further tested for their versatility in the fields of illustration, news photography, and retouching. The examinations are long and arduous, but more candidates pass than there are jobs.

It will take time to appraise what is being accomplished by this enormous activity in classes and clubs; but one is safe in the assurance that in no other subject are there so many students taking the course of their own volition.—▶

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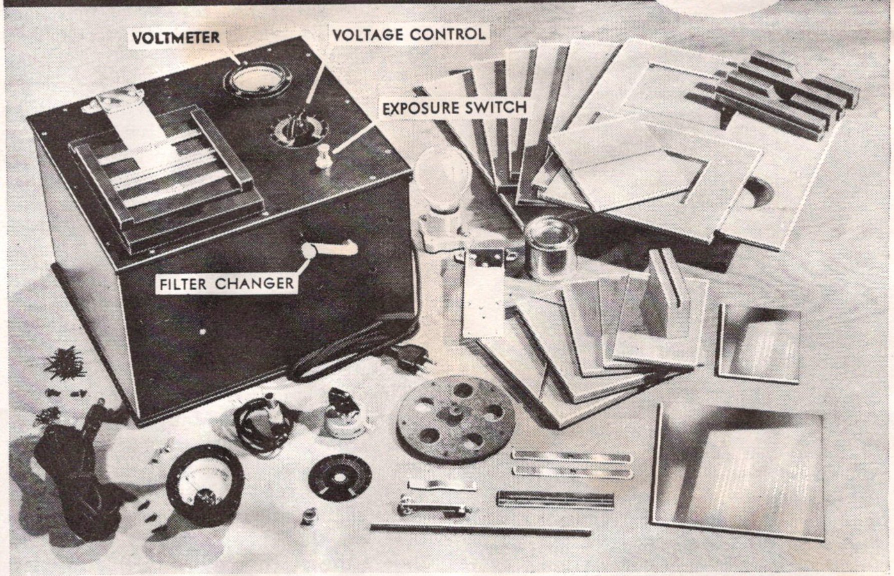

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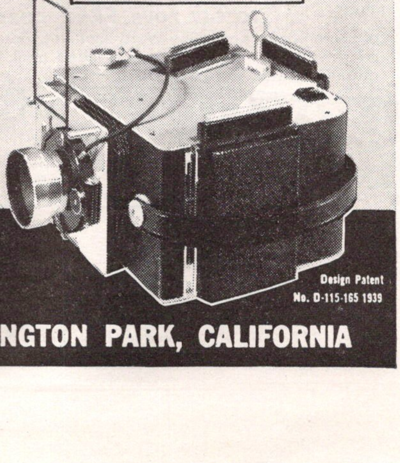

Design Patent
No. D-115-165 1939

THOMAS S. CURTIS
LABORATORIES
2063 EAST GAGE AVENUE, HUNTINGTON PARK, CALIFORNIA

Projecting Black-and-White

(Continued from page 60)

contact printing. Use no masks: it is preferable that the margins of the positive be exposed, so that they develop black. And if you bind your transparencies into slides the cardboard masks or mounts will take care of final masking requirements.

Exposure will depend on the strength of your printing light. While positive film is not nearly so sensitive as negative film, it is much faster than contact printing paper. A 25-watt electric bulb several feet from the printing frame will enable you to make exposures as short as can be timed conveniently. If you use a printing box, it will probably be necessary to substitute a bulb of very low wattage, or reduce the light by placing several thicknesses of white or light-tinted tissue paper over the lamp.

The best method of determining exposure is by test. Make several positives from a typical negative, giving each a different exposure, such as 3 seconds, 6 seconds, and 12 seconds. Develop, fix, and dry these, and project them on the screen you plan to use. Choose the positive which yields the best *screen* picture in the size desired, and keep this, together with the negative, handy for reference in later printing. Similar tests for negatives which are thinner and denser than normal should also be made.

In a fully developed but unfixed positive, the brightest highlights should be veiled over appreciably. If you are accustomed to judging paper prints in the developer, your first correctly-exposed positives will appear to you to be somewhat foggy and overexposed before fixing. Do not let this mislead you; the slight additional density in the highlights is quite necessary for proper rendering of highlight detail on the screen.

Exposure is best judged by the progress of the image during development. If the image flashes up quickly, and gains undue density as development continues, overexposure is indicated. If the image appears slowly and fails to gain density in the proper time, the positive is underexposed. The easiest and quickest remedy, in either case, is to throw that positive away and make another.

Special developer formulas are used in the machine processing of professional motion picture positive prints. For tray development of positives printed from miniature negatives, however, familiar formulas such as D-72 are recommended. D-72 is available in package form, ready to mix. For developing positive transparencies it should be mixed as follows: 1 part stock to 2 parts of water. Development time at 65 degrees F. will range from 2 minutes for positives printed from normal to 8 minutes for positives printed from flat negatives.

For lower contrast, or for normal positives from negatives of high contrast, development up to 8 minutes in D-76 is suggested. For higher contrast than that obtained with D-72, an 8-minute development in undiluted D-11 is recommended. D-11 is preferable for titles and for positives from line negatives, where maximum contrast is desired. These two formulas—D-76 and D-11—are also available in package form.

Develop in trays having smooth interior surfaces to avoid scratching the film during processing. White enamel trays are preferable. Immerse the film so that it is covered quickly and evenly with the developer. If any air bubbles form, remove them immediately with a finger-tip, gently applied.

After development, rinse the film for a few seconds in clean water. In hot weather, use a freshly-mixed hardening rinse (1 ounce of potassium chrome alum dissolved in 1 quart of water). Agitate the film for several seconds when you first place it in this bath, and allow it to harden for 2 or 3 minutes.

Fix in a standard acid hardening-fixing bath. A ready-mixed package formula will do, if you do not mix your own. Good hardening is especially desirable in positives intended for projection.

After fixing, wash the film thoroughly (20 to 30 minutes in running water); then gently sponge off any surface water, and dry in a place which is as free from dust as possible.

The dried positives may be masked and bound between 2 x 2" slide cover glasses, using an adhesive binding such as Kodaslide or Scotch Tape. Or they may be simply inserted in any of the various types of ready-to-use slide mountings which are available. The glass slides provide maximum protection against finger-marks and scratches; the prepared mounts have the advantage of speed in mounting, lightness, and thinness, important features when the slide collection is large. Certain types of ready-to-use mounts incorporate glass in their design.

For convenience in projection, place a small sticker or "thumb spot" on each slide. This sticker should appear on the upper right-hand corner of the slide, facing you when the slide is positioned properly for insertion in the projector. The spots enable you to arrange the slides in correct upside-down position for projection, emulsion toward the projection screen, without examining each picture.

Naturally, no black-and-white slide can compare with a good full-color shot of the same scene. But if you shoot black-and-white as well as color, film positives offer you an opportunity to obtain double service from your home projector, and you'll find that projection adds interesting quality and dramatic effectiveness to almost any picture.—

"Non-Skid" Enlarging Easel

PROBABLY one of the greatest annoyances in photo enlarging is to have the easel slip just as you are placing the paper in it. This can easily be prevented by removing the rubber buttons with which easels are generally equipped and replacing them with one or two rubber stairtreads from the five-and-ten. A rubber mat such as used under sink drain-boards works equally well.—*Walter Hoag, Buffalo, N. Y.*

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Transparency Printer

(Continued from page 61)

open each toy, take out the sprocket, and remove the knurled knob from it by filing away the peened-over end.

The light-box is constructed of ½" boards nailed together. The outside dimensions are 6½" x 8¼", the inside depth being 5¼", as shown in Fig. 1. Shellac the inside, and paint the outside and the tops of the sides a flat black. To make a more efficient light-trap, paint a 1" black band around the inside of the box at the top.

Next make the cover, a ½" board 6½" x 8¼". Fasten to the under side of the cover by means of flat-head wood screws a frame made of ⅜" x 1" wood strips set edgewise as shown in Fig. 7. The outside dimensions of this frame are just small enough to fit inside the box to make a light-trap and allow the cover to lie flat upon the box. In the center of the cover cut the printing aperture, a rectangular hole 1 9/16" x 1".

Remove the emulsion from a glass plate and cut a piece 2" square to make the glass cover for the printing aperture. Using a wood chisel cut down the cover around the printing aperture until the surface of the glass is even with the top of the cover as shown in Fig. 1. Paint the under side of the cover and the outside edge of the frame a flat black to complete the light-trap, and shellac the top. Paint the recess for the glass cover a flat black.

The platen (Fig. 3) is made from two pieces of wood. Cut and shape the pieces before fastening them together with four flat-head wood screws countersunk into the short piece as shown. The film slot is cut by drilling a row of holes and sawing between them with a coping saw; finish the edges with a file, sandpaper them smooth, then shellac the unit. A piece of green felt 2" wide is used to cover the platen, the ends being tacked to the top surface (see Fig. 3). Narrow down this felt strip where it passes through the film slot, being sure to have it perfectly smooth along the bottom of the platen.

The two hinge pieces, by which one end of the platen is attached to the box, are made from 1/16" x 1⅛" flat stock. Bend this, and drill all holes ⅛" as shown in Fig. 4.

The two sprocket supports (Fig. 5) are next made of ⅛" x ½" flat metal. Drill and countersink the two holes in each to fit the flat-head wood screws with which they will be fastened to the platen. The 9/64" hole is *not* countersunk.

Fig. 6 shows a front view of the sprocket assembly, together with a cross-section of the platen through the film slot. A visit to a machine shop will now be necessary to secure a ⅛" x 12" piece of round brass rod and to have the following parts made for the sprocket assembly.

The end-spacer is of brass ⅜" in diameter x ⅝" long. Drill a ⅛" hole through the center and countersink one end. The film drum is made of brass turned to 29/32" outside diameter, with a ⅛" hole drilled

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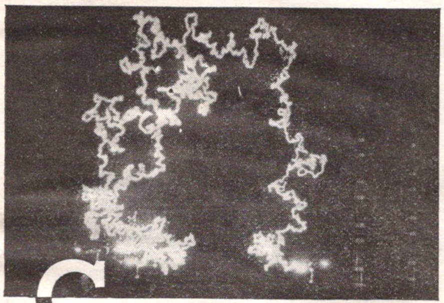

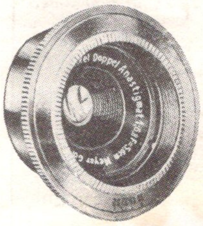

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through the center. The length of this drum with a sprocket at each end should be $1\frac{3}{16}$". Be sure that it is the correct length so that there is no buckling or stretching of the film on the sprockets.

Take the sprockets and an old film with you to the machine shop so that you can wrap the film around the drum to test it for length. Then have them cut off a piece of 1" round stock ¼" thick and drill a ½" hole through the center to make the index wheel. Cut off a piece of 1" hexagonal stock ¼" thick and drill a ⅛" hole through the center to make the knob for turning the sprockets. The drum, index wheel, hexagonal stock for the knob, and the end spacer are all shown in Fig. 6.

To finish the index wheel take one sprocket and the 1" round piece and slide them on a short piece of the ⅛" brass rod. With a three-cornered file make four evenly spaced marks around the circumference of this round piece, using the teeth on the sprocket as a guide to space the marks as shown in Fig. 6.

Place the film drum with a sprocket at each end on a piece of ⅛" brass rod 3½" long, wrap the drum and sprockets with two turns of old safety film, and bind tightly with string. This will align the teeth of the two sprockets and they can now be soldered to the shaft as shown in Fig. 6. Next solder the index wheel to the shaft in the correct position with each of the marks on its circumference lined up with the center of the space between two sprocket teeth.

Put into place on the shaft a copper burr and one of the sprocket support pieces, and solder the 1" hexagonal piece into place to provide a knob with which to turn the sprockets. Now place the ⅜" diameter x ⅝" end-spacer with the countersunk end toward the sprocket, and put the remaining support in place on the shaft. The assembly can now be screwed to the platen. The position of the sprocket assembly with relation to the film slot in the platen is shown in Fig. 7.

An old radio phone jack supplied the spring stock to make the ratchet stop shown in Fig. 7. Have the ratchet press against the sprocket nearest the index wheel. This will allow a mark on the index wheel to be lined up with the prong on the ratchet spring to provide a framing check when printing. This mark when moved ahead one "line" or ¼ turn moves the positive film ahead one single frame; two lines or ½ turn moves it ahead one double frame.

Bend a piece of the ⅛" brass rod to provide a guide for the film at the rear of the platen. Drill two ⅛" holes through the felt into the platen and install as shown at B in Fig. 3.

To provide a tension device for the film remove the velvet-covered angle piece from a filmpack and cut off a piece 2⅜" long. Fasten this piece across the platen, velvet side down, with two round-head wood screws. Bend the two forward corners down a little to lift the uncovered edge. Later you can adjust the friction on the positive film by means of the hold-down screws (see A in Fig. 3.)

The platen is now ready to be fastened to the cover by means of the two hinge-pieces and round-head wood screws. Be sure it is square with the printing aperture. This can be accomplished by mounting a piece of old negative film on the platen and placing it in proper position by viewing through the printing aperture from underneath the cover. Mount the hinges as shown in Fig. 7, so that the platen lifts and moves away from the cover as it is raised. Tighten the hinge screws in the side of the platen to provide just enough friction to keep it in a raised position without your holding it.

With a razor blade cut a hole the size of either a single or a double frame in the middle of a piece of black paper 6" x 6½". Now mount an old negative on the platen, register the hole in the black paper with the negative frame on the platen, and thumb-tack the black paper in place on top of the box cover. Turn the cover over and look through the aperture from underneath while adjusting the register. Now put in place four more thumb-tacks to provide a track on the cover to guide the negative over the printing aperture. These should be placed two at the rear edge of the cover and two at the front edge. The heads of these tacks provide a perfect flange for the film to slide under.

For the light system you will need two sockets, a door-bell push-button, wire, and a connection plug. Fasten the socket for the ruby light to the bottom of the box at the rear, with the lamp vertical. The printing lamp socket is mounted horizontally against the front of the box close to the bottom as shown in Fig. 1. The printing light is a 7½-watt frosted bulb which is screened by covering the lamp bulb with tissue paper to bring the average printing time for a normal negative to about 8 seconds. The ruby light is wired to burn continuously while plugged in and the printing light is wired in series with the push-button to provide a convenient switch for printing. The wiring diagram is shown in Fig. 2.

The photograph shows the printer from the rear with the platen raised to manipulate the negative. A negative is shown in place over the printing aperture and a short piece of positive film is in place on the platen, emulsion side out.

To prepare the printer for operation select a normal negative and place it in position over the printing aperture, emulsion side up. Cut off a short piece of positive film and lay it upon the negative with the emulsion side down. Then lower the platen and make a trial exposure, and develop this print according to the manufacturer's directions.

At the start, in the interests of film economy, it is well to make trial exposures of a few representative frames on short pieces of positive film, without threading the platen. Then develop these short test pieces to see what the best exposure time is for the negatives at hand. With the information gained from these trial exposures it will now be fairly simple to allow more or less time when the frames have more or less density than the ones used for testing. Do not make your positive prints too dense, as this cuts down illumination when you project them. You will also find that many frames which are useless for paper prints or enlargements will produce fairly good positives for projection.

Now cut off enough positive film for your first projection roll, allowing 8 inches at each end for leaders. Thread the platen by passing the film, emulsion side up, under the tension device, through the rear guide, and around the underside of the platen. Take it up through the film slot and over the sprockets and drum so that it passes between the sprocket and the ratchet spring. Have one of the file marks on the index wheel line up with the prong on the ratchet spring. Now place the negative in the track and adjust the first frame over the printing aperture and judge the exposure time. Lower the platen and make the exposure. Raise the platen and move the positive film ahead one frame, using the index wheel for a guide as previously stated. Slide the next negative frame into position, judge the exposure time and print the second frame as before, repeating this process for each print. Now develop, fix, wash, and dry the film according to directions.

Your positive film is now ready for the projector (unless you prefer to bind it into slides first); and from my own experience I know you will be amply repaid by the added interest your pictures have when viewed on a screen.—⚑

How Fast Is Your Film?

(Continued from page 35)

doubling of film speed; three degrees less represent one-half the speed. A Scheiner rating of 23 degrees means the emulsion is twice as fast as an emulsion rated at 20 degrees, but only one-half the speed of an emulsion rated at 26 degrees.

THE H&D RATINGS

H&D speeds are now seldom, if ever, employed in this country. Ilford H&D values are often used in England. The true H&D speed is measured as shown on the graph at the point where the continuation of the straight line portion of the H&D curve touches the exposure axis. The exposure value at this point is divided into the constant 34 and this gives the H&D speed. With films of less than 1000 H&D this method was fairly satisfactory but as the film speeds rose to the levels of today, the exact speeds became difficult to determine with any de-

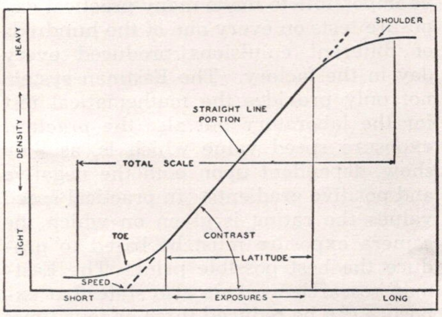

Fig. 5. Showing the various portions of a typical H & D curve (see page 35).

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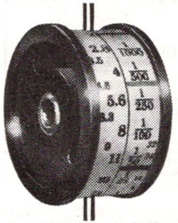

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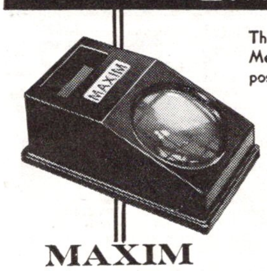

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WESTON SPEED RATINGS

In the United States, in addition to the American Scheiner speed values, the Weston numbers have been listed since the Weston Electrical Instrument Corporation started the manufacture of electric exposure meters about seven years ago. Weston speed values are laboratory measurements obtained from regular H&D curves, investigating the exposure on the straight line portion of the curve; but instead of measuring the speed by the whole of the straight line portion, a point is taken near the middle of the line as a reference. The Weston investigators consider properly the gamma to which the particular type of emulsion is being developed in common usage.

Although independently and conscientiously arrived at, the Weston numbers are fairly consistently 1/50th of the H&D numbers as listed by the *British Journal Almanac* and the *British Journal of Photography* for September 1932.

The newer emulsions are often difficult to measure by both the H&D and the Weston systems, because they do not always exhibit the normal H&D curve with a long straight line showing proportionate density to proportionate exposure increase in the half-tone range. Many modern emulsions are coated with a number of emulsions, one on top of the other, and as these emulsions develop at different rates the integrated densities do not always show the normal curve. Unless the curve has a normal straight line, H&D and any other system based on densities in the straight line portion must be checked by practical exposure, development, and printing tests.

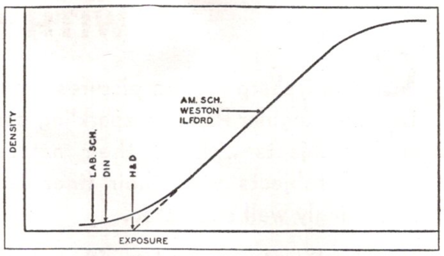

Fig. 6. Points used for different speed ratings on H & D curve are shown here.

H&D, Weston, and any other system of speed values yet to be presented which is based on the H&D curve can be relatively compared. By way of example, an emulsion of 1000 H&D is twice as fast as one of 500 H&D, but only one-half the speed of an emulsion rated at 2000 H&D. An emulsion rated at 24 Weston is twice as fast as one rated at 12 but only half the speed of one rated at 48.

COMPARISON OF SPEED SYSTEMS

The following table of comparison of speed rating systems is presented as a general guide. Mathematical conversion is, of course, impossible, because the systems have no common basis and vary too widely in application. Practically, however, the various speed numbers can be loosely compared with each other to provide a general indication as to where a film's place is in any of the systems.

UNITED STATES OF AMERICA

* American Scheiner Degrees	** Weston Numbers	DIN Degrees	* * * H & D Numbers	Relative Exposure x
8	0.75	1/10	35	32
9	1	2/10	45	27
10	1.3	3/10	56	21
11	1.5	4/10	72	16
12	2	5/10	91	13
13	2.5	6/10	117	11
14	3	7/10	150	8
15	4	8/10	190	7
16	5	9/10	240	5
17	6	10/10	308	4
18	8	11/10	390	3⅓
19	10	12/10	500	2⅔
20	12	13/10	636	2
21	16	14/10	800	1⅔
22	20	15/10	1050	1⅓
23	24	16/10	1300	1
24	32	17/10	1700	4/5
25	40	18/10	2100	⅔
26	50	19/10	2700	½
27	64	20/10	3500	2/5
28	80	21/10	4400	⅓
29	100	22/10	5600	¼
30	125	23/10	7200	⅕
31	160	24/10	9100	⅙
32	200	25/10	11600	⅛

* As used on Mini and Photoscop Meters.
** As used on Weston Meters
*** As published in British Journal of Photography, Sept. 9, 1932, and British Journal Photographic Almanac, 1934.

SPEED RATING METHOD OF THE EASTMAN KODAK RESEARCH LABORATORY

The latest system to be brought forth is one in which I am deeply interested. It was worked out by the Eastman Kodak Research Laboratory. The Eastman scientists state very correctly that the negative material is not the only factor which must be considered—the gradient of the positive material, which affects the quality of prints, is also a retroactively controlling factor. It has been proven that it is impossible to use any fixed inertia point or any fixed density as a reference point for speed determination. In the Eastman method many actual exposures were made, and from every negative the best possible print was produced. After the best prints were determined by a number of competent judges it was found possible to work back and find an H&D curve characteristic which could be used for laboratory speed determination.

It is necessary that the testing laboratories have a simple mathematical test for use in speed measurement, as it would be impossible to make many practical exposure tests on every one of the hundreds of different emulsions produced every day in the factory. The Eastman system not only provides the mathematical test for the laboratory but also the *practical* exposure speed value which is, as they show, dependent upon both the negative and positive gradients. In practical speed values the rating is given on which the camera exposure must be based to produce the best possible print. The Eastman research workers also state that exposure can be reduced three or four times if only a *passable* print is desired.

REGARDING STANDARDIZATION

Though exposure meter manufacturers work in close harmony with film manufacturers, testing all emulsions submitted to them and checking these findings with the practical print results of expert users of their meters, there is still much to be done on film speed standardization. I am of the opinion that standardization of film speeds is on the way. There is no gainsaying the fact that it is a difficult problem; but now that the American Standards Association is taking a part in the discussions in this country we believe that speed standardization will soon be effected, since this organization approaches the matter with an unbiased viewpoint.

Years ago, the Royal Photographic Society undertook to standardize the aperture markings on lenses, and though progress was slow, it is due to the Society's efforts that we find lenses today marked according to its recommendation.

To date most of the proposals for film speed standardization have come from individual film or exposure meter manufacturers, but it would be far better if the speed standards could be so worked out as not to be identified with any one manufacturer's name. Any system adopted must be freely available—without the necessity of asking permission of anyone to use that system of marking on exposure meters or sensitized material.

The system known as American Scheiner embodies all practical considerations and endeavors to take into account the processing of the film. The system of speed markings is free to all and is, I think, a very convenient one to use. For one thing, the doubling of film speed rating with each three Scheiner degrees does not assign an extremely high number to a fast film. It will be a long time before film speeds reach three figures in Scheiner degrees. If film speeds are marked in hundreds or thousands, then the figures on the exposure meters must be made small and consequently difficult to read. Nevertheless, it is probable that the testing laboratories will prefer a finer scale of speed progression like the arithmetic progression on the H&D speeds.

In the case of the Eastman Kodak Research Laboratory presentation mentioned previously, their three-digit figures would be rather cumbersome on meter dials; but outside of that point I am heartily in favor of their method of speed determination. If they were to drop the last figure, or consider it a decimal, which could be easily omitted on meter dials, then their speed values as taken from published figures would be as follows:

Daylight:	Published Kodak Lab. Film Speed	Suggested Standard Listing	American Scheiner (Mini Photoscop)	Weston
Super-XX	400	40	29	100
Plus-X	200	20	26	50
Panatomic-X	125	12	24	24

It will be for the American Standards Association to decide which system of speed measurement shall be recommended as the standard—either the commonly used American Scheiner or the new Eastman system, which latter, to my mind, is the best, based as it is on actual tone reproduction and not simply on the film characteristics.

I restate the preface of my *Exposure Meter Manual:* "The negative is only a means for a purpose; the final aim of the photographic process is the *print.*"

Film speed rating must take the print into account.—▶

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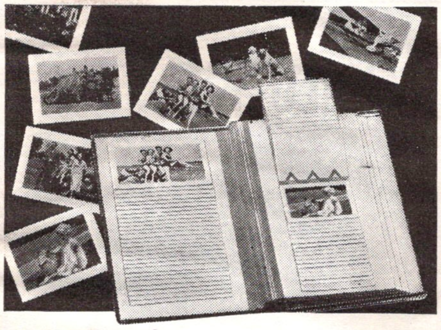

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A Farewell to Dust

(Continued from page 36)

If the room is apt to be chronically dusty, a little sweeping compound or oiled sawdust on the floor will lay the dust. In extreme cases, the floor may be wetted.

The next place where dust is apt to be deposited is on the negative during drying. Much of this trouble can be avoided by laying the negative on a clean piece of glass or a ferrotype tin and wiping excess water off with a clean windshield wiper or moistened viscose sponge. This will not hurt the negative, and will greatly reduce the time during which the negative will be damp enough to collect dirt. The wiper should be cleared of water with a bit of cloth or paper towel after each stroke across the negative. If you use a sponge, wring it out frequently.

Every photographer who really wants to save himself grief should build some sort of drying box. This is simply a box in which the negatives are protected from dust and dried by a current of warm air. You can easily design one which suits your needs.

If you dry negatives in an open room, close the windows and don't let people wander around and stir up dust inside the room. All negatives should be dusted with a camel hair brush and placed in separate envelopes *as soon as they are dry*. Roll film negatives may be cut into strips of convenient length, each strip being placed in a separate envelope.

When negatives happen to get dusty there are several things to do. Of course, dust which is not embedded in the surface may be brushed off with a clean chamois. Dust which is stuck to the negative can be removed with alcohol on a piece of cotton. In particularly bad cases the use of retouching equipment may be necessary, although this method is scarcely adaptable to miniature negatives.

If your negatives are clean you should have relatively little trouble with dust when contact printing. The upper surface of the glass in the printing box should be wiped with a chamois, and should be washed occasionally if you use Scotch tape to hold down the negative. If you use a simple printing frame, just make frequent use of the chamois, and don't work in a dusty place.

The majority of dust spots occur in the process of enlarging. To eliminate these, the same method of laying the dust with sweeping compound should be used, and all tables should have smooth surfaces which should be gone over frequently with an oily rag. Excess oiliness should be avoided, however.

Enlargers should be protected with some sort of a dust jacket. The oiled silk bags with zippers made for covering kitchen equipment are ideal, but ordinary paper bags work very well.

Grounding the enlarger by means of a wire to a convenient water-pipe or radiator will get rid of much static electricity. This static is generated largely by the changing of negatives and by sliding the lamp-housing along the upright when making enlargements of various diam-

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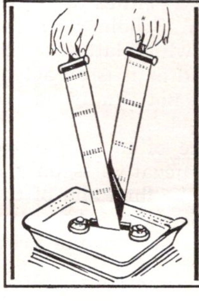

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eters, and it tends to attract dust particles to the lamp-housing, where they head for the negative and negative carrier. Care should be taken not to attach the ground wire in such a way that a short circuit might ensue, but there is no danger of this under normal conditions.

Next we come to one of the oldest superstitions in photography, namely that negatives must be held between glass while they are being enlarged. These pieces of glass have four surfaces to collect not only dust but fingerprints as well, and cause no end of trouble.

In place of the glass, simply use two metal plates (24 gauge or thicker). In the center of each plate have an opening cut slightly smaller than the negatives you normally enlarge. The plates should be perfectly flat. Put a little emery powder between the plates and rub them together to get perfectly true surfaces. The plates should be hinged along one side with adhesive tape, so as to form a "book." For those who enlarge roll film without cutting the roll, four guide pegs may be placed on one plate, with corresponding holes in the other plate. These pegs will keep the film in line while it is being drawn between the plates when changing negatives. All edges should be rounded with a file and made as smooth as possible to prevent scratching the film.

If several sizes of film are to be enlarged, a number of plates will be necessary. However, they are very inexpensive, and can be cut at any machine shop. The outer dimensions of the plates should correspond with the pieces of glass normally used in the negative carrier. Most enlargers have some device to keep the glasses under pressure. This will generally work equally well with the metal plates, but in some cases the pressure must be increased.

The metal plates will not prove entirely satisfactory when the full area of a large negative (4x5" or larger) is to be projected, or when you are dealing with a pack film which has become crinkly through improper drying, etc. In such instances the negative area within the cut-out portion of the sandwich is too large to be held perfectly flat, especially when subjected to the warmth of the enlarging lamp.

You must remember that when you remove the glass from above the negative in this manner you are removing the film's insulation from the enlarging lamp. Therefore unless your enlarger is amply ventilated you must be careful not to allow the negative to become too hot. Many a negative has been permanently ruined by heat in the enlarger.

You will find that the metal plates work perfectly when used with the smaller sizes of roll film or when you enlarge a small section of a big negative. Naturally the dust problem is most acute when a small portion of a negative is enlarged a great many diameters, and in a case like this the plates will prove their worth most convincingly. Large negatives may sometimes have to be trimmed so as to bring the desired portion within the cut-out opening.

In passing it might be pointed out that by doing away with glass you automatic-

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ally rid yourself of the dread possibility of getting Newton's rings. These sometimes occur when the back of the film comes in contact with the glass plate in a negative carrier, and they can ruin a print more completely than dust can. Another advantage of a glassless negative carrier is that it will shorten printing time.

If you are accustomed to using a printing frame for holding your paper while enlarging, you can get rid of the glass here too. The edges of the frame will generally hold the paper flat enough, and the only function of the glass is to pick up dust. The glass can be easily removed from most frames.

One other item. Don't say that people have no sense of art because they notice the spots on your prints rather than the effect of the whole picture. If you don't care enough about your work to do a clean, workmanlike job, you'd better not complain.—■

Picture Post Cards

(*Continued from page* 56)

plenty of humor, apt illustrations of a catchy or timely phrase make popular cards.

No special equipment is necessary because post card stock is obtainable in both projection and contact papers. Inasmuch as contact papers are considerably less expensive and titling will be easier on the larger negatives, the most practical plan is to contact print the cards. A 3½ x 5¼ second-handed camera may be purchased for very little. It is especially practical, however, to make the views with a smaller camera and print from enlarged negatives. With Agfa's Superpan Reversible film only one step is necessary to obtain the larger negative and several advantages occur when this process is employed. Cropping or projection control may be utilized to aid the composition. The contrast may be improved. The master negative is spared the wear of constant handling. If composite prints are desired, or clouds are to be printed in, it is best to make a large print and then copy that to the 3½ x 5¼ format of the post card after all the hand work has been done.

The title may be lettered on the back of the negative with India ink or with opaque. In either case, a coating of clear varnish over the back of the negative will keep the title letters from flaking or scratching off. Your name and address as photographer will be printed on the card for a nominal fee when stock is ordered in lots of five thousand. Considerable economy is also effected when orders are of this size.

When a suitable collection of negatives is available, samples should be printed and as many orders as possible obtained before making up duplicate negatives or ordering a large quantity of stock. Before seeking orders, the photographer *must have* his price scale clearly defined. This is not difficult because costs are readily calculated. In quantities of one thousand the post card stock will cost just

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over a dollar per hundred. Haloid Nomis or Industro is the most economical stock and gives excellent prints as well. Only one contrast, a medium grade, is necessary. It is quite convenient to alter the strength of the developer to take care of negatives with slightly greater or lesser than average contrast.

Chemicals and wastage will add about fifty cents a hundred to the cost of the cards. Later, when it is possible to order stock in large lots and runs of several hundred are made in printing, the cost may be reduced by about one-third, so that the cards do not average more than a cent apiece. Darkroom maintenance is not included in these figures.

It is suggested that the cards be sold to the dealers at the following prices: 25 cards, 4 cents each; 26 to 75 cards, 3½ cents each; 100 to 1000 cards, 3 cents each; over 1000 cards, 2½ cents each. The dealers will sell the cards for 5 cents each.

Many dealers will be found reluctant to stock the 5-cent cards, feeling that the tourist does not want to pay that much for them. In some cases that may be true. But most tourists have decided on the number of cards that they need and the cost does not seem to alter that decision. On the other hand, the sight of unusual quality or subject interest will mean the sale of extra cards. Inasmuch as the dealer's profit is about five times greater per card on the more expensive "5-centers" he has greatly increased profit possibilities in them. If the dealer is still convinced that his best bet is the penny card, offer him the cards on a money-returned agreement, to get him to give them a trial along with the cheaper variety. If your work is good, he'll probably send for more of it.

Personal contact is the most effective method of selling the cards to dealers. Your enthusiasm for your work is better able to show. However, nearby markets may be contacted by mail. Possibly a local dealer will give you a letter expressing satisfaction with the cards. Usually he is on friendly terms with nearby dealers and his word is a great help. Samples, especially if mailed, should be of the very best quality.

After several markets have been secured, display cards for counter or window use should be worked up and offered to the dealers. An enlargement of one of the views, together with some text calling attention to the unusual or distinctive cards to be found inside, makes an excellent window display. A generous commission will interest the dealer in pushing framed enlargements. These are a source of nice profit.

The efficiency and orderliness with which you conduct your printing and distribution will determine whether you will have a pleasant sideline or an unprofitable nuisance on your hands. Negatives should be carefully indexed and filed and a sales record kept. Runs of under a hundred cards are not advised but orders should be filled promptly. Quality and service is the answer to competition. The dealer will reorder the cards that sell best even though he may have to pay a little more for them.—▶

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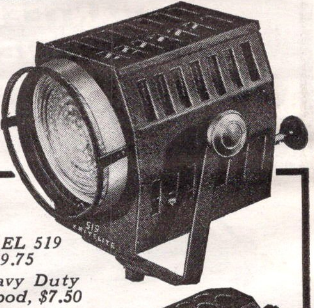

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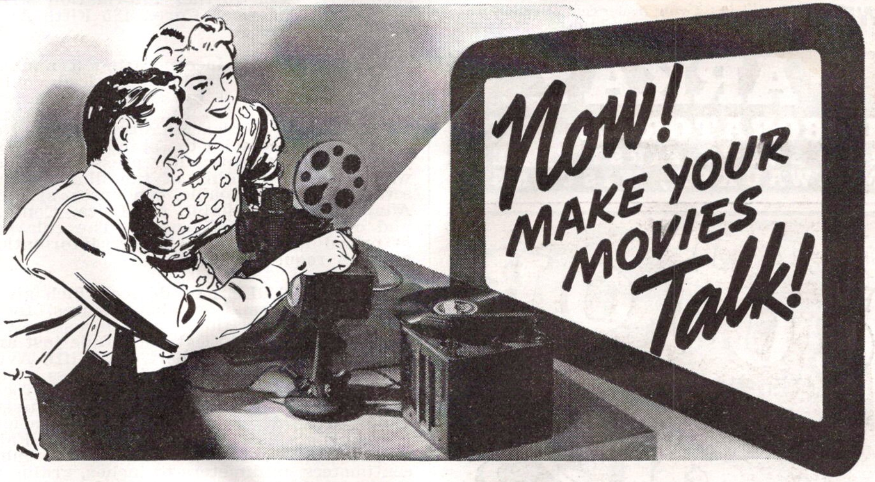
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Trade Notes and News

(Continued from page 68)

jector which gives an image size of 36x52" at 13 ft. The Viewer-Projector is made of cast aluminum with black finish, features a heat-absorbing device, 100-watt lamp, and 4" projection lens with rack and pinion focusing. The price is $39.50. A carrying case and slide file are also available.

A NEW exposure calculator of simple design yet adaptable to outdoor, artificial light, stills and movies is announced by Francis X. Dotterweich, Dunkirk, N. Y. The device is made of celluloid, 2¾" in diameter, and gives accurate light values for all latitudes, months, and hours; speeds from 1/2000 sec. to several hours; stop openings from *f* 1 to *f* 45. Price, complete with manual and case, $1.50.

A COMBINED camera handbook and catalogue has just been published by National Target & Supply Co., 1255 25th St., N. W., Washington, D. C. Besides a descriptive and illustrated listing of cameras, projectors, and accessories the book contains instructive articles on such subjects as "Choosing the Still Camera," "Exposure for the Beginner," "Developing, Printing and Enlarging," etc. Price of the book is 25c.

AMATEURS who own more than one camera will be interested in the new Mico adjustable filter holder with screw-in sunshade. Made of brass in satin chromium finish, each size holder is adjustable within liberal limits. Prices range from $1.90 to $2.40 for sizes from 25 mm to 39 mm respectively. For further information write to Mimosa American Corp., 485 Fifth Ave., New York City.

A NEW enlarger incorporating a number of features found in higher priced equipment is announced by Universal Camera Corp., 28 West 23rd St., New York City. Known as the Univex Micrographic, the device is equipped with the standard Mercury *f* 3.5 lens, automatic film pressure release which permits sliding of the film without scratching, and double condenser system. Adapters are available for Leica, Contax, and other makes of lenses. The enlarger is priced at $27.50. Further information sent on request.

A REMARKABLE new device which gives necessary information about lenses, focal lengths, magnifications, and measurement is the new Hyde Optical Slide Rule just announced by Henry Herbert, 483 Fifth Ave., New York City. Made of stainless steel, the rule takes into consideration the focal length of the lens and the aperture used, giving depth of field and other information. It also contains tables for converting Fahrenheit to Centigrade, ounces to cubic centimeters, millimeters to inches, grains to grams, and vice versa. The rule measures 6½" long, 1" wide, and ⅛" thick. It sells for $1.50.

A UNIQUE innovation is announced by the Penn Camera Exchange, 126 W. 32nd St., New York City. It is the Personal Shopping Service, organized to assist persons living anywhere to obtain any photographic equipment desired. Further information on request.

A LARGE, up-to-date catalogue of photographic equipment has just been published by George Murphy, Inc., 57 East 9th St., New York City. It contains 272 pages, listing the products of all the leading manufacturers, and can be obtained for 25c. This amount will be deducted from the first purchase of $1.00 or more.

LATEST edition of the Gevaert Catalog Price-List is off the press. A copy can be obtained from your dealer or from The Gevaert Company of America, 423 West 55th St., New York City.

THE NEW Supermatic precision-built shutter with speeds to 1/400 second recently announced by Eastman Kodak Co. is now available on the Kodak Special Six-16. The camera will retail at $43 without case; $45.75 with case.

A NEW three-section all-chrome tripod suitable for use with all types of cameras is announced by Burleigh Brooks, Inc., 127 West 42nd St., New York City. The legs when closed are 23" long and extend to 60". Although rigid, the tripod weighs only about 3 lbs. Known as the Bee Bee Atlas Tripod, it is priced at $7.50.

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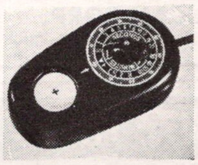
TWO new circulars recently prepared by E. Leitz are obtainable on request. One is booklet No. 7838 describing the Gnome II projector, the other No. 1277 describing the 50 mm Summitar *f* 2 lens. Requests should be addressed to E. Leitz, Inc., 730 Fifth Ave., New York City.

A NEW booklet entitled "Better Outlines For Your Home Movies" describes the use of the Effectograph, and is obtainable on request from Besbee Products Corp., Trenton, N. J.

OWNERS of 6.5x9 cm plate back cameras can now obtain roll film backs. These are announced by Photo Utilities, Inc., 10 West 33rd St., New York City. Backs taking the standard 8 or 16 on 120, or 12 on 120, list at $11.00. The 35 mm back lists at $20.00.

A CIRCULAR describing Willo Darkroom Aids—printers, easels, etc., can be obtained on request from Willoughbys, 110 West 32nd St., New York City.



EnlargOmeter

A NEW instrument for determining printing time and selection of proper printing papers for enlarging only, the EnlargOmeteR, is announced by The Research Engineering Co., 302 S. Michigan Ave., Chicago, Ill. The printing time of a negative may be determined without calculations in a few seconds, and two readings taken over the projected area determine the proper grade of paper to use. The device operates on 105 to 120-volt AC or DC current. The bakelite case makes it safe, shock-proof, and resistant to darkroom chemicals. A booklet with complete working instructions is provided with each instrument. EnlargOmeteR is priced at $4.75 and can be obtained from your dealer or direct from the manufacturer.

A MAKE-UP kit for use with color film is announced by Miner's, Inc., 12 E. 12th St., New York City. Containing 20 different make-up materials, in correct blended shades, the Foto-Crome Kit retails for $2.50 complete with instruction booklet.

RECENTLY developed for color photography is the new Munder Color Flash Lamp which produces a source of light having all the spectral characteristics of bright sunlight. Further information can be obtained from Munder Electrical Co., Springfield, Mass.

A GIANT almanac catalogue of 128 pages, 8½x11, is being prepared by Fotoshop, Inc., 18 East 42nd St., New York City. Publication date is Sept. 15th. The publication will sell for 25c which will be credited on the first order.

Picture Analysis

(*Continued from page* 58)

ages are perfectly calculated. The tone and color renditions are masterly. The edge definition is just of the right degree of sharpness for the purpose. The print is on smooth matte paper. The textures are sufficiently well suggested to render verisimilitude to the print. Distance and solidity are well achieved. Just enough motion to tell the story. Well balanced, but there is a slight shortcoming of unity, clarity, and emphasis. All of this is embodied by the light streak under the body of the horse just in front of the hind legs. The sky shows through there; but by being too small a spot, it looks more like a streak which adheres to the horse, than a distant part of the horizon.

The horse should have been posed higher, or the spot should have been enlarged with an air brush. As the spot is unduly emphatic by being unclear, this would have improved a picture, which, in my opinion, could not be improved in any other way.—

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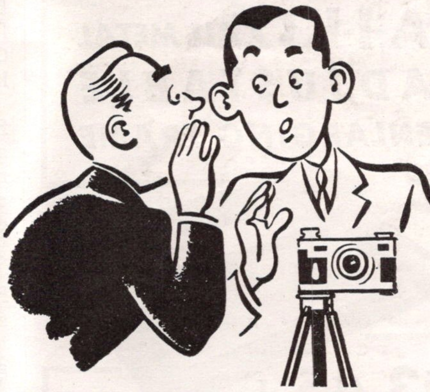

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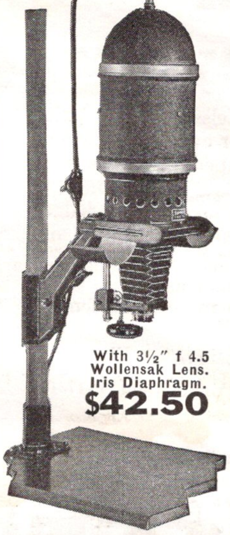

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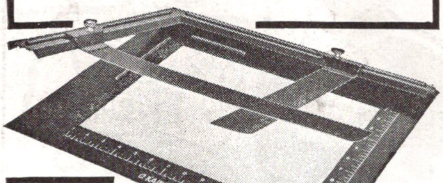

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Toni Frissell

(Continued from page 33)

on the steps in the sand. I never use a filter for sand—just stop the lens as far down as possible. In this case, my camera was the Super Ikonta B, ƒ 2.8 lens, aperture ƒ 20. Exposure 1/25 second.

"My favorite print, I think, is that of the two girls playing in the pool at Palm Beach. It makes such a good composition. You will notice it is a series of triangles. I like the designs of the water. The aperture was about ƒ 8, as I recall. The exposure was 1/100 second." Beyond doubt it's a swell picture.

One of the Frissell photographs which evoked a great deal of discussion is the girl asleep in the hay. If anybody else had done it, it would probably be just another beautiful professional model, lying with her head thrown affectedly back. But Toni Frissell blows the breath of naturalness on the surface of her film. This picture, according to the photographer, was taken with a Contax at 1/50 second, aperture ƒ 16. The resulting print was made from a fractional part of the negative only. The model is Miss Katharine Aldridge.

The photograph of Miss Frissell's which I admire most of all, is the one of her two children, Varick and Sidney (a girl), taken in the flower-sprinkled garden of her St. James, Long Island, home. For sheer pastoral beauty, exquisite security—it cannot, to my mind, be beat. Again, the Super Ikonta B was used, exposure 1/100 second, aperture ƒ 6.3.

In private life this famous photographer and portraitist is Mrs. Francis McNeil Bacon III. Her corn yellow hair and China blue eyes first made her seem attractive material for the stage. When she finished at Miss Porter's Farmington, Connecticut, school, a relative persuaded her to tread the boards.

"I quit because of my great height, five feet ten and one-half inches, and my great lack of talent," Miss Frissell told me. "The high point of my theatrical career was in 'Danton's Tod' where I earned fifteen dollars a week for saying 'phooey'."

Miss Frissell is a splendid athlete and holds refreshing ideas about women and sports. "Girls should know how to play tennis," she observes, "but they better let golf alone. They are apt to be dubs at it."

When Miss Frissell works she chews gum. She has the patience of Job and will spend hours in getting costume details correct or finding the right natural background for a subect. Her home at St. James was built in 1689. She and her husband collect antiques as a hobby. The photographer wears strictly tailored clothes but manages to look entirely feminine in them.

From a quite modest start, Toni Frissell has developed into one of America's greatest camerawomen. Every picture she makes carries on the continuity of increasing brilliance. Proving once again that the only quality of which a human being can be entirely sure in this world is the work he does and the intelligence and personality he applies to it.—▶

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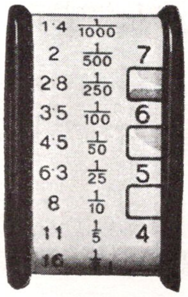

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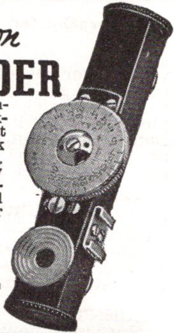

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Sound in Your Movies

(*Continued from page 57*)

ence, the amateur can connect the loudspeaker (placed behind the screen) to the phonograph (set beside the projector).

Another method used by many amateur movie makers is the "sound-on-film" technique, which is divided into two classifications, namely the *single* and the *double* systems.

In the single system the sound is recorded in the same camera that takes the picture. The double system provides for the recording of the action and sound on separate films, which are combined on a single "print" during the processing.

Generally speaking, a single-system outfit consists of a set of batteries, a recording element, a microphone, and a camera which is run by a synchronous motor at 24 frames per second. A synchronous motor is not highly essential in the single system, since the sound and the picture cannot get out of step.

Editing of a single-system sound film is readily accomplished, and may be done without throwing the continuity off. You simply need to allow 1 second at the beginning and at the end of each scene during which no important sound is recorded. It is assumed, of course, that you will exercise some care in the way you shoot the story. In rearranging scenes only that infinitesimal amount (1 second) of picture and sound track will not correspond.

In setting up the outfit the operator must make sure that the various pieces of sound equipment are out of range of the camera lens. The "mike" need not be placed extremely close to the scene of action. The pick-up of any microphone is determined by the power of the amplifier into which it feeds. In normal movie use this power limits the radius of pick-up to about 10 or 12 feet (except for very loud sounds).

The placing of the "mike" so as to pick up several different voices properly, the mixing of the inputs from several "mikes," and the arranging of furnishings for best acoustic results make up a separate subject, for a discussion of which there is not sufficient room here.

The cables which connect the "mike" with the recording element and camera should be hidden under the rugs, if any, or camouflaged with furniture or other household accessories. The recording mechanism, which turns the sound waves into variations of light and then transmits them onto the film in the form of a sound track, should be set behind the cameras. The recorder can be controlled for volume and clarity by an assistant.

Now a word about the double system. Here, the action and the sound are recorded on two separate films and then printed on a single strip. In this process a recording element is also used to record the sound, but this may be done after the film has been shot. The advantage of this system is that objectional noises such as coughs can be cut out without interrupting the continuity of the film. The

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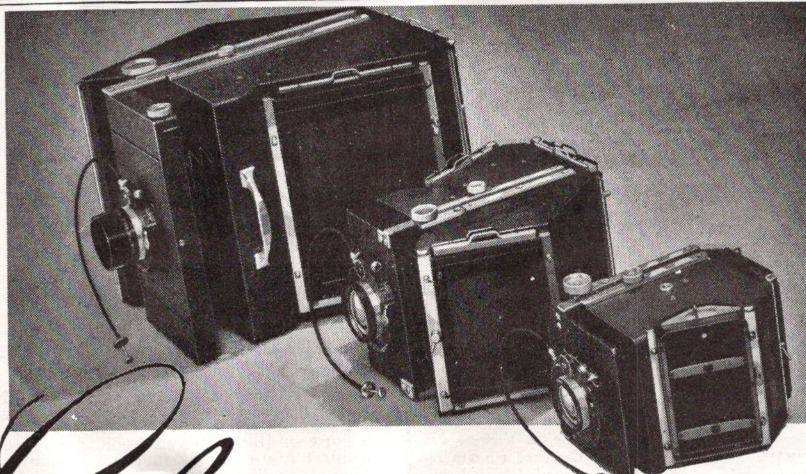

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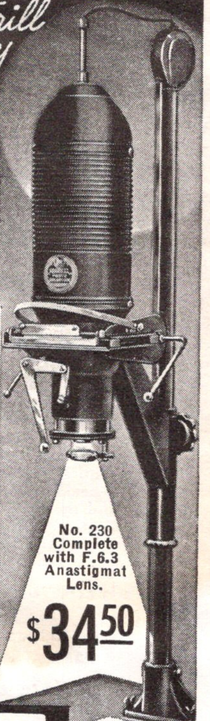

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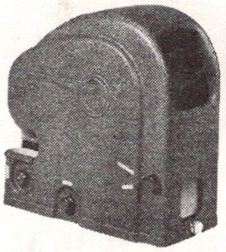

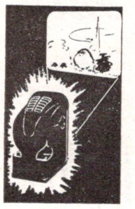

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double system is used frequently when movies are made in places where it would be inconvenient to set up sound equipment. In such cases the movie is filmed silent, sound being added or "dubbed in" later.

In the double system, as in disc recording, subsequent lip synchronization can be accomplished only by mechanically or electrically coupling the recorder with the projector during recording. To avoid complication, the lip synchronization and the picture should be made at the same time.

The third and final method is sound accompaniment. It is by far the least expensive and therefore the most widely used. Although this system does not produce elaborate results, it serves as an excellent training ground in sound technique, and can teach the beginner much about timing, volume, etc.

The equipment required includes a cheap microphone, a phonograph, a loud-speaker, an amplifier, and a selection of musical records. Of course you cannot produce dialogue, but you can furnish excellent musical and voice accompaniments. Through the microphone, you can add your own comments while the film is being shown. Music is supplied by means of the phonograph, which is also connected to the loud-speaker behind the screen.

When adding your own comments through a microphone, never "ad lib." Prepare your manuscript with the utmost care, and rehearse it plenty. When speaking, turn down the volume of the music. Loud voices and loud music never combine well.

We have described the more important methods of combining sound with motion pictures, as practiced today. With the increase in popularity of this phase of amateur movie-making, it is certain that the cost of equipment will be lowered sufficiently so that sound pictures will be available to many more enthusiasts.—⚑

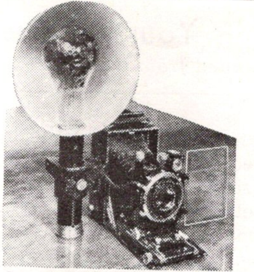
Camera Clubs

(Continued from page 70)

Westchester C. C. (Mt. Vernon, N. Y.) recently held its 10th annual dinner and election of officers. Each member received a copy of the club yearbook, a photographic annual made up of members' prints. Nice idea. . . . The Third Rhode Island National Salon of Photography will close its entry list on October 30. It is sponsored by the *C. C. of Rhode Island,* whose salon chairman is A. J. Viera, 103 Westminster St., Providence, R. I. . . .

A comprehensive season's program is planned by the *Dayton Photographic Society,* which will meet regularly in the American Room of the Gibson Hotel, Dayton, O. The October meeting will be held in the auditorium of the Dayton Power & Light Co., and will feature an abundance of artificial light, suitable backgrounds, models, etc. . . . Best wishes to *Shorewood C. C.* of Milwaukee, which group in its 10 years of existence has attained an enviable national rating. . . .

The Aremac Club (Wilmington, Del.) is holding meetings in the Wilmington Academy of Art. Club members compose two classes, one of which is studying composition, the other dealing with the manipulation of photographic materials . . . *Delaware County C. C.* is meeting in its own quarters, located at 7168 Marshal Rd., Upper Darby, Pa. . . . Winter's coming, so get the darkroom in readiness for those hours you're going to spend in making salon prints from the summer's batch of negatives. . . .



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Advertising Pictures

(*Continued from page 55*)

every month?"—we decided on a grave-faced mother and two children. Not much for a starter, I think you'll agree. It's up to the art director to work out the situation in a rough layout, placing the figures approximately as they will appear in the finished photograph. (This often takes a great deal of thought, but I won't go into that, because you're interested in the photographer's work, not the art director's.) The art director's sketch is the rough pattern which the photographer follows when he makes his shots. In this case our subject matter called for a photograph with a "heroic" feeling—dangerous ground unless handled by a camera *artist!* But before we consider the "feeling" of the photograph, there are technical problems to solve.

It was my job to work out this composition so the mother's face would be dominant—so that her left hand with the wedding ring (symbol of the dead husband) would get in the picture—so that the children's faces would be prominent for contrast, but not detract from the central figure of grief. These are things that must be thrashed out carefully ahead of time on paper, in proper proportion, with a sure knowledge of the human figure for guidance. A faulty calculation in anatomy in the original sketch can leave the photographer in a terrible hole surrounded by models who cannot naturally "bend themselves" into the picture that has been ordered. After all, just so much space is allotted for the picture.

But now suppose we have our sketch in the photographer's studio; we are ready to make it come alive. The art director sits down and explains the story to the photographer and also to the model, for he must by hook or crook win from her the expression he wants. "Your husband is dead," he says. "You're wondering how you're going to pay the milkman." And, "What would you do if these children were really yours and the bank had just sent you an 'over-drawn' notice?"

The model, if she knows her job, will give you *exactly* what you want—*at some fleeting moment!* The photographer, if he's a really great photographer, will have his lights set to dramatize that fleeting shade of expression that is so precious, and will catch it *because he has an uncanny intuition about such things.* And the children? Well, I can't give you a magic formula, but in this case the photographer was also doing flip flops to delight the little girl, while his assistant was tickling the baby's toes!

The choice of models either makes or breaks your photograph. You have, of course, the help of well-organized model agencies. But still you may have to scour the town for just the face you need for a particular situation. And then, when you have almost given up hope, and a closing date is staring you in the face, you may luckily happen on that madonna with the "spiritual" look selling trinkets behind the counter in a five and ten cent store!

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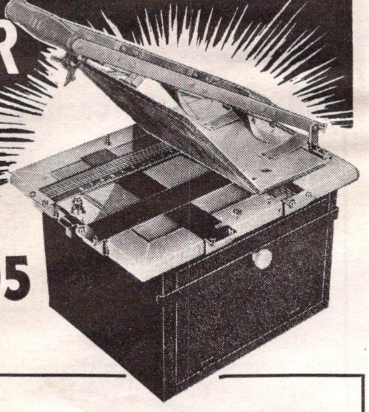

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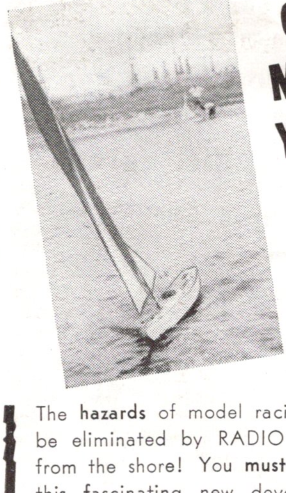

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OCTOBER ISSUE

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tograph, the one with the headline: "For the landlord . . . they'd have to have money every month." Here is a trite situation right out of the barn-stormers of the 90's—the villainous landlord come to turn poor Nellie and child out into the storm! But look what can happen to this old tear-jerker in the hands of a photographer who is an artist.

The landlord is a rather decent chap in spite of that determined chin that says he means to collect the rent *or else*. The child is no Shirley Temple but she has the kind of a face that can say, "This man is a stranger." "Mama," as we agency people refer to all matrons in pictures, looks like a wife and will *not* remind our insurance prospect of the girl who sang torch songs at Jim O'Connel's, as all too many professional models might.

Notice how our photographer used his lights to dramatize the faces and the mother's nervous hands. See how he kept his background subdued, but not too dark, because our picture must show an attractive home that tells a story of happier days. Note how the expressions on the faces of the landlord, the child, and the mother are all coordinated as though the landlord had just spoken. Our photographer has worked with his models as a fine play director does with his actors. Dealing with an emotional situation which skirts dangerously on the slippery ground of sentimentality, he has *dramatized* this little tragedy with verisimilitude. It looks like *life!*

Often you hear how difficult it is for a new photographer to "break in." All alert art directors are ever on the lookout for new talent, for a fresh photographic conception. Perhaps *you*, who are an amateur today, may be one of the great photographers of tomorrow. *Amateur*, in my language, is a proud title. You can't even qualify for that if your samples exhibit any lack of understanding in the fundamentals of both the technical and artistic phases of photography.

Modern cameras and films have freed us from numerous limitations. But they have produced many good camera technicians who are all too often only mediocre advertising photographers. The really fine photographer has an innate talent, an originality which enables him to visualize and materialize, through the mechanics of his camera, thought reactions which are compelling, stimulating, vital. He has a visual perception which goes *beyond* the mere pleasure of observation. He has cultivated a sharp and, at the same time, a very subtle feeling for photographic drama. Often, through years of experience, he has worked out his own particular way of building to his drama with light, as a stage director builds to his dramatic climax with voice cadence and timing of his actors' lines. The really fine photographer knows people. He has learned how they react and how to *make* them react to tell his story.

Add to these qualifications the ability to start a job at four in the afternoon and have prints for the client when the office opens next morning and you have the answer to an art director's prayer! "Breaking in" will be no puzzle for such a photographer!—▶

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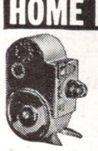

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Photomontage

(*Continued from page 21*)

tions of the negatives to be reduced to clear celluloid. Blend in around the parts being preserved for printing so that there is no abrupt drop from the image to blank film.

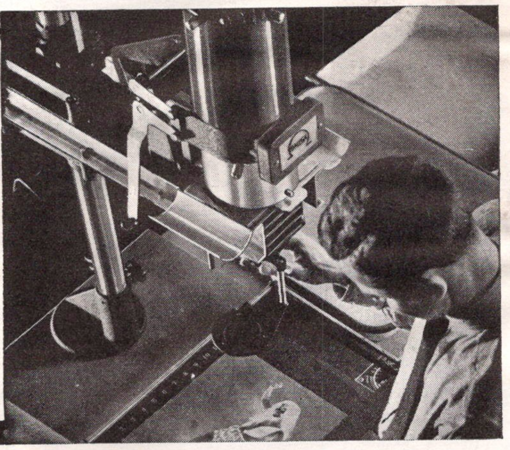
I use a reducer with a saturated solution of potassium permanganate as a base. It is prepared by dissolving ¼ ounce of potassium permanganate in 3 to 4 ounces of water, after which ¼ ounce of sulfuric acid is added. Because the potassium permanganate stains the negative, about 150 grains of potassium metabisulfite are dissolved in 8 ounces of water and the solution used to clear the negative of the stain. The negative is soaked in a tray of the second solution until clear. In working with either of these solutions remember that the stronger they are the faster they work. It would probably be advisable to avoid excessive speed at first until you have acquired some familiarity with the action of the chemicals.

I give preference to this reducing method over such other reducers as Farmer's and potassium persulfate largely because it is the safest to have about the house. The potassium ferricyanide in Farmer's reducer sometimes stains the negative, and it is a stain that is next to impossible to remove. The greatest disadvantage of the pale yellow potassium ferricyanide stain is the fact that it is virtually invisible to the eye, although it shows up in the print as an ugly black spot.

The cause of the stain, and another objection to Farmer's reducer, is the fact that it decomposes rapidly and the photographer continues to apply it to the negative long after it is played out. The permanganate reducer keeps indefinitely, while the ferricyanide-and-hypo reducer must be mixed shortly before use and fresh batches must be mixed rather frequently.

After the various negatives have been washed and dried, they are assembled and bound together with Scotch tape or lantern slide binder. They are then ready to be placed in the enlarger and printed as one. With the enlarger light passing through several negatives at once, you may have to stop down the lens more than usual in order to get all the images sharp on the easel or paper. Only a few negatives should be bound together for simultaneous printing, because of the thickness of the film and the fact that the cleared celluloid is not absolutely transparent. If you wish to incorporate a much larger number of negatives into the montage, use some other method.

A third means of making montages (perhaps the most satisfactory of all) is to make a number of black-and-white prints from the negatives to be used in the combination print and rephotograph them on one film. Be sure that the contrast in the prints is soft; *not weak*, but with detail in the shadows and with no chalky highlights. Try to include all the negative's detail in the print. Make the prints without masks because white mar-



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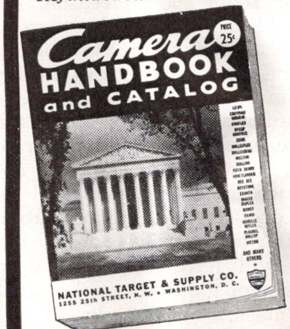
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gins might play havoc with a montage made in this manner.

Use a much larger paper size than the negative or the image wanted would seem to require, in order to leave an ample black margin around the image. Keep each image in proper proportion to those on the other negatives, so that the camera will not have to be readjusted too much in photographing the various prints. It is possible to enlarge or reduce the image in rephotographing it, of course, but this is apt to rob the method of its chief advantage: the ability to show all parts of the montage in correctly balanced strength.

When you are ready to photograph a print, pin it down to a copy board. Lacking one of these, an ordinary drawing board will do. All of the prints are photographed individually on one film, preferably a slow film such as Eastman or Defender commercial.

It will be seen that a plate-back camera is desirable for this purpose, so that by inspecting the groundglass in the back of the camera you can ascertain the relative position of each rephotographed image on the montage negative as you proceed. It is well to use a rough sketch to guide you. In order to spot the pictures in their proper places I usually rule four horizontal and four vertical lines on the groundglass itself, using India ink and a ruling pen. Similar lines on the sketch facilitate the proper scaling down of the image from the sketch.

To place each image correctly on the film it will be necessary to shift the camera left, right, up, or down. If the images are correctly proportioned the camera focus will remain unchanged.

To protect the part of the film which is being saved for subsequent exposures, some sort of masking device is necessary. It is best to use a sheet of cardboard more than large enough to cover the entire film when placed midway between the lens and the print being copied. The size of the board depends on the camera being used. By way of example, a 11 x 14" board should suffice for a 4 x 5 camera.

In the middle of the cardboard, make a hole, the size and shape of which will be decided by the image being used in the montage. It may be necessary to use openings of several sizes to accommodate the various images. When this is the case, make one large hole in the cardboard and fit over it smaller pieces of opaque paper or cardboard with apertures of the proper size and shape cut in them. If, for some special reason, the cardboard is placed sufficiently close to the print for the edges of the hole to show, use some procedure such as cutting or roughly tearing the edges of the opening so that an indistinct line edges the image. If the mask is brought closer to the camera lens, the rough edge is not necessary, since the diffusion caused by the lens is enough to produce subtle blending. After a few trials each worker will find he will have no difficulty in judging the size of the holes or the point at which the mask should be placed.

An elaborate method for holding the mask in position is to make a special

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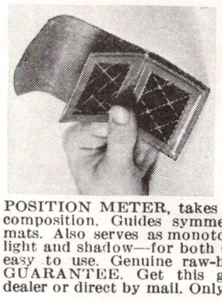

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standard fitted with some device for moving the mask vertically and horizontally. The average amateur, however, will find a sheet of cardboard fastened to an arm of a light-stand to be satisfactory. It may be raised or lowered by adjusting the various sections of the stand. Lateral movement is obtained simply by moving the stand together with the mask.

As each image is finally placed on the groundglass, trace its outline with wax pencil, brush, paint, or ink. This serves as a guide for the placement of the next image after the negative has been removed. Be sure the exposure given in rephotographing each one of the images is correct. Unless you wish dark areas between the different projections, be sure to make the fading edges of the images overlap. After all the exposures are completed, the negative is ready for developing. Use some formula that yields clean, crisp copy negatives, something in the "MQ" class.

When the negative has been developed, fixed, and washed, if certain of the images are over- or underexposed (making some parts denser or thicker than others), it is easy to remedy matters so that the several images are of about equal density. Portions can be intensified locally by a slow-working intensifier gently applied with cotton to the underdeveloped part. I use the old solution consisting of chloride of mercury combined with potassium bromide:

Mercuric chloride	150 grains
Potassium bromide	150 grains
Water	16 ounces

First thoroughly dissolve the mercuric chloride in the water. Don't do it hurriedly. It is difficult to dissolve. Then add the potassium bromide.

Holding the negative in a wire hanger, dip a tuft of cotton in the intensifier and rub it over the portion which is to be strengthened. Rinse every few seconds under tap water and examine by holding the negative over some white object, such as a white enameled tray. Never examine negatives on which you are working by transmitted light. You can judge the density better by uniformly reflected light.

When the desired density has been reached, blacken the negative with a solution of sodium sulfite in water. The proportion doesn't have to be exact. In a few minutes the intensified part that seemed yellow turns black, and it corresponds evenly with the other parts.

To lighten the density, use a weak solution of the same reducer used for clearing portions of the negatives, the potassium permanganate and sulfuric acid formula described previously. Work slowly, with a well-illuminated white reflecting surface nearby. Very frequently examine the part being reduced. Further adjustments may be made in the relative density of the images by printing-in or holding back any portion of the completed photomontage when the combined negative is printed.

If you wish to show the images with black between them instead of with their edges overlapping, it is only necessary to project the images smaller and leave enough area between them to give the

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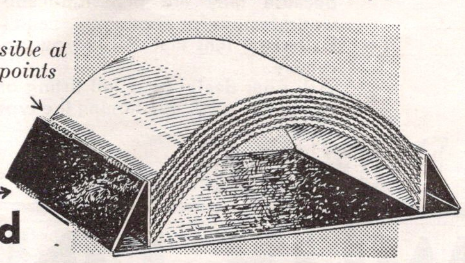

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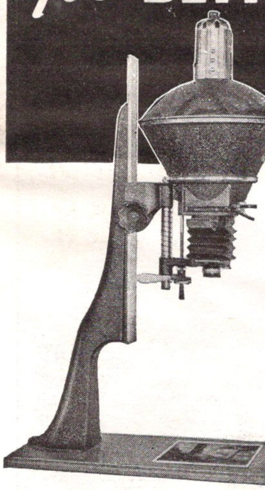

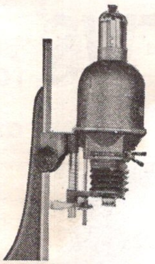

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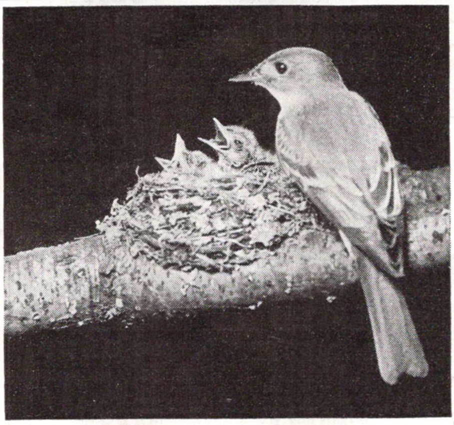

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effect of several images, somewhat separated from each other, with black intervening.

A variation of the method just described involves the substituting of live models for prints when you are making your multiple-image negative. This procedure is not often employed when any great number of images is needed. The model fees can run costs up, for one thing. And there is apt to be more laborious changing of camera position, bellows extension, etc., than when you are simply copying prints.

Nevertheless, I once had to make a montage by this means to illustrate an advertisement for Dr. West's tooth paste (see picture on page 21). The advertising agency needed this sort of picture in a hurry, and no other available method would fill the bill in the time at our disposal. We sent for several models, and spent at least 3 hours in photographing them on a single piece of film. Each model was posed and lighted in several different ways.

This required many changes in camera position, and constant adjustment of the camera bellows. Exposure time varied when there was any considerable change in the camera position, of course, and this necessitated rather careful calculation of exposures. We wanted the image densities to be pretty well equalized.

Finally, after a lot of work and worry, the exposures were all made, and we developed the film. In spite of some apprehension on my part, the negative was a good one, and a little local reduction here and there (with dabs of cotton and a dilute reducing solution) gave us just what we wanted.

Combine or modify any of these three methods of working, to find the method that strikes you as most satisfactory for your photomontage work. Use just one technique until you have thoroughly mastered it. Then give full rein to your imagination. The photomontage will serve as your magic carpet!—⚑

Give Your Child a Camera

(Continued from page 19)

yet one that counts tremendously. Long ago we began taking pictures with a moving-picture camera. We took the pictures of the birthday parties and the family celebrations at Christmas and Thanksgiving. One picture we all like to see at least once a year. It is the record of a gay birthday party for a little boy and his grandmother. It shows him and his granny sitting in state in the garden while the gay procession passes before them curtsying and saluting as they pass.

Granny is not with us now and the small boy is a college man. The room is dark when we look at that picture and we are all glad of it. But not for the world would we miss seeing it once more.

There will be such pictures in your family, and they will have such values if you have knitted them in there with family affection and understanding, and a good camera.—⚑

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MIDGET RADIO CO. Dept. PP-10, KEARNEY, NEBR.

Exposure Meter

(Continued from page 59)

other or jump apart. However, if we turn one magnet around so that a north pole is facing a south pole, the magnets will be attracted or drawn to each other.

The third property of the magnet to be considered here is that there is an invisible magnetic field of force around both poles. This invisible force can be made visible by placing a piece of white paper over the magnet and sprinkling the paper with iron filings. This will show that lines of force pass between the poles in a somewhat scattered manner.

For our purpose it is necessary to concentrate these lines of force. This is accomplished by shaping the ends of the magnet as shown in one of the illustrations accompanying this story. To bring about a more radial distribution within the area between these two ends, or pole pieces, a piece of soft iron, cylindrical in shape and known as the core, is inserted in this area.

The moving coil in our galvanometer consists of a rectangular aluminum frame around which are wound approximately 1000 turns of fine wire, insulated with special insulating material. The wire and its insulation together measure .001" in diameter.

In order to allow the coil to move freely, it is absolutely necessary to reduce friction to a minimum. Thus we have two pivots, .0008" in radius, turning in sockets made from synthetic sapphire jewels. At one time genuine jewels were used, but it has since been found that a synthetic product reduces the coefficient of friction. Further precaution is taken by counterbalancing the pointer and cross-arms so as to have the center of gravity fall within the minute base provided by the pivots.

Expert handling is required to assemble this mechanism. Skilled craftsmen, working under ideal atmospheric and lighting conditions, are required. Despite the delicate handling necessary and the minuteness of the parts, the coil is so built as to withstand the ordinary usage given an exposure meter. Its accuracy is impaired only by constant jarring or jolting, unduly high temperatures, and excessive moisture.

Let's see how the movable coil operates. It is placed in between the pole pieces of the magnet, with the iron core in the center of the aluminum frame. In this position, the coil is free to rotate upon its pivots within the radial field of force set up by the magnetic lines of force flowing from the magnet's north pole to its south pole. Thus, when light strikes the photoelectric cell and causes current to flow, a wire leads this flow of electricity through the many turns of wire in the coil. As soon as a current is set up, the coil acts like two small magnets, in that one side of the frame becomes a magnetic north pole and the other side a south pole.

Since unlike poles attract and like poles repel, we now have a condition wherein the north pole of the magnet repels the

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J. A., of El Paso, Texas, recently won a prize offered by Popular Science Monthly for writing a "Success Story." In it he said:

"I saw the ad of a correspondence course in photography and decided to investigate. To make a long story short, I took the course and never regretted it since. Painstakingly the school showed me my errors and taught me how to take pictures that sell. I learned why my previous pictures hadn't sold, good as they were. Even before I finished the course, the school helped me to market enough photos to pay more than half my tuition."

"It has enabled me to add from five to twenty dollars extra to my income every week. It financed two vacations, one to Mexico. I want to say to the many ambitious men—and women too—engaged in uncongenial work that the home study route offers perhaps the safest way out known. It reduces to a minimum any time and money lost in switching from one line of endeavor to another."

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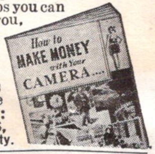

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north pole of the coil and conversely speaking, the south pole of the magnet repels the south pole of the coil. This repellent action tends to rotate the coil, the amount being indicated by a pointer set over a scale. The greater the light intensity, the greater the flow of electricity through the coil, and thus the greater its rotation.

To return the coil to its original setting after the flow of current has ceased, two coiled springs located at the top and bottom of the moving coil are utilized. To check the adjustment, cover the meter's light window so as to exclude all light. Under this condition, the pointer should rest squarely over the zero mark. In the event that the meter is not registering zero it should be sent back to the manufacturer for adjusting. Some meters are equipped with a set-screw, by which this adjustment may be made.

In closing, mention should be made of the care one must observe in handling his exposure meter. As previously stated, the instrument as a whole is ruggedly built, and although no delicate electrical mechanism will withstand careless handling, the exposure meter is built to last. Ordinary "wear and tear" will not affect its accuracy. Keep it out of excessive temperatures and protect it from excessive moisture. Avoid any dropping, jarring, or jolting as far as possible. Do not attempt to fix a meter, for as soon as you remove the cover plate, the manufacturer's guarantee becomes void. Return the defective product to the factory where repairs will be made by experienced workers for a nominal sum.—■

Candid Shots

(*Continued from page 10*)

sary, as published in POPULAR PHOTOGRAPHY, has been revised and amplified. It is on the press and will be ready soon for distribution. Next month we will announce the exact date of publication.

FROM Sweden comes a complaint against the abuse of low angles in photography. Alec Borg of Stockholm dislikes intensely photographs of girls taken from the curb. "The human eye never sees them like that," he writes. "A dog perhaps. I know you get the sky as a background and the lines of the bust (if any) comes out very nicely and all that. But could you not do anything to stop it and earn my eternal gratitude?"

Alec seems to be wishing a lot of power to us. And we'll need it if we are ever to set out on crusades of the kind he desires. Nevertheless, we are inclined to agree with him and are putting his plea before the public.

SOME people get all the breaks! They have fun with their cameras, see the world, and get paid on top of it. How would you like to be in the place of Ivan Dmitri or Martin Munkácsi, traveling from New York to Brazil, from Canada to Hawaii, being received like a Maharaja, covering an assignment, and picking up additional nuggets of gold on the side?—*A.B.H.*

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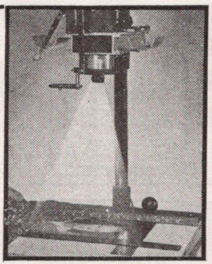

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NEW BOOKS

THE TECHNIQUE OF PICTORIAL PHOTOGRAPHY, by Paul L. Anderson. Published by J. B. Lippincott Co. Cloth bound, 5¾x8½, 404 pages, illustrated, $3.50.

The author, a nationally known photographic expert, has written this book for the amateur and professional photographer of 1939. It covers in a clear, concise manner the current developments in cameras, films, lighting, processing, and color. Illustrations include explanatory diagrams and photographs in addition to a number of examples of pictorial photography.

ON HOLIDAY WITH A CAMERA, by Robert H. Goodsall. Published by the Fountain Press, London. N. P. Handbook No. 13. Paper bound, 4¾x7¼, 64 pages, illustrated, 75c.

A book which tells you how to get the best out of your camera in making a photographic record of your vacation—the places you visit, the people you meet, and highlights of the trip.

A series of new Kodak Data books are announced by the Eastman Kodak Co.

These books, available through Kodak dealers at nominal prices, contain a tremendous amount of specific, practical information in handy form. They are paper bound, in uniform 6x8½ format, and illustrated.

KODAK FILMS, 56 pages, 15c. Discusses characteristics of roll films, filmpacks, miniature, and cut films—speed, contrast, filter factors, the uses and processing of each film, etc.

KODACHROME, PHOTOGRAPHY IN COLOR, 52 pages, 25c. A comprehensive discussion of Kodachrome film, data on its use, exposure technique in both daylight and artificial light, advice on use of exposure meter. A number of illustrations are in color.

WRATTEN FILTERS, 40 pages, 15c. Deals with filters from practical and theoretical standpoints. Diagrams and illustrations in black-and-white and color supplement text and demonstrate use of various filters and the Kodak Pola-Screen. Reference tables aid selection of proper filter for a given need.

EASTMAN PHOTOGRAPHIC PAPERS, 48 pages, 15c. Gives full information on the various brands of Eastman photographic papers, their photographic and physical characteristics, a number of formulas, etc. Specifications contain practical data on the most commonly used papers and include exposure scale values and characteristic curves.

PROFESSIONAL KODACHROME PHOTOGRAPHY, 32 pages, 25c. Gives helpful information on color photography in general and complete instructions on lighting for Kodachrome photography both indoors and by daylight. Also includes information on exposure determination, making of color separation negatives, make-up, backgrounds, etc.

Any one of the books listed here can be obtained either from your local camera dealer or POPULAR PHOTOGRAPHY'S Book Dept.

HF Guaranteed BARGAINS BY AN AUTHORIZED DEALER

Leica Model IIIb, Summar F2 Brand New	$150.00
Leica Model G, Summar F2, eveready case	109.50
Kine Exakta, Carl Zeiss Biotar F2	210.00
Kine Exakta, Primoplan F1.9	149.50
Kine Exakta, Carl Zeiss Tessar F2 8	119.50
Kine Exakta, Exaktar F3.5	98.00
Exakta B, chrome, Zeiss Tessar F2.8	97.50
Exakta B, chrome, Zeiss Tessar F3.5	87.50
Rolleicord Ia, Zeiss Triotar F4.5	39.50
Rolleicord II, Zeiss Triotar F3.5	54.50
Automatic Rolleiflex, Zeiss Tessar F3.5, eveready case	104.50
Maximar B, 9x12cm., Carl Zeiss Tessar F4.5	54.50
Maximar A, 6½x9cm., Carl Zeiss Tessar F4.5	47.50
Zeiss Super Ikonta B, latest model, Zeiss Tessar F2.8	97.50
Contax III, Sonnar F1.5, eveready case	174.50
Contax III, Sonnar F2.0, eveready case	159.50
Contax II, Sonnar F2.0, eveready case	134.50
Contax I, Zeiss Tessar F2.8	69.50
Robot I, Zeiss Tessar F2.8	74.50
Robot II, Zeiss Biotar F2.0	137.50
Speed Graphic 3¼x4¼, Zeiss Tessar F4.5	84.50
Speed Graphic 2¼x3¼, Zeiss Tessar F4.5	89.50
Speed Graphic 2¼x3¼, Zeiss Tessar F3.5	102.00
Speed Graphic 2¼x3¼, Kodak Anas. F4.5	84.50
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Korelle Reflex II, Zeiss Tessar F2.8	97.50
Korelle Reflex II, Radionar F2.9	77.50
Kodak Retina II, Retina-Xenon F2.0	84.50
Kodak Model 35, Kodak Anas. Special F3.5	24.95
Kodak Model 35, Kodak Anas. F4.5	17.95
Kodak Model 35, Kodak Anas. F5.6	10.50
Kodak Recomar 2¼x3¼, Kodak Anas. F4.5, Compur	37.50
Kodak Recomar 3¼x4¼, Kodak Anas. F4.5, Compur	45.00
Kodak Bantam Special F2	54.50
Argus C2, F3.5, coupled range finder	18.50
Zeiss Super Ikonta A Special, Zeiss Tessar F3.5	79.50
Leitz Vidom Finder	18.50
Zeiss Contameter for Contax II	48.00
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Keystone Model M8, 300-Watt	29.50
Keystone Model R8, 500-Watt	40.00
Kodascope 8 Model 50, 300-Watt	30.00
Kodascope G, 750-Watt, F1.6	98.50
Keystone A75, 500-Watt, F2.5	40.00
Keystone A81, 750-Watt, F1.6	52.50
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Kodak 25, F2.7 Anastigmat	32.00
Kodak 60, F1.9 Anastigmat	49.50
Bolex 8, Kino Plasmat F1.5	195.00
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Simmon Omega B, no lens	45.00
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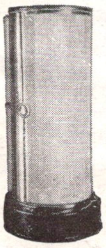

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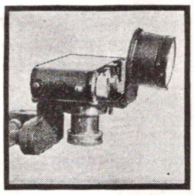

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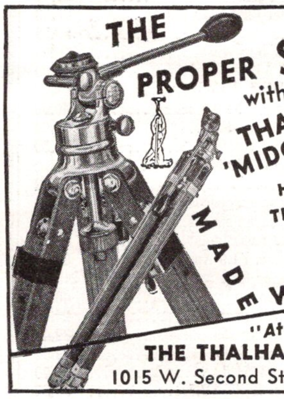

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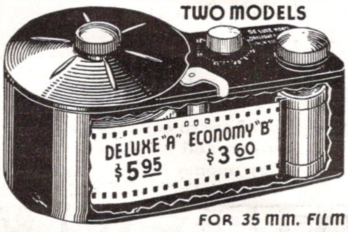

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Popular Photography, 608 S. Dearborn St., Chicago, Ill. A "free for all" photographic contest for black-and-white pictures and color pictures. Prizes amounting to more than $3,700.00 in cash and valuable photographic merchandise. First prize $500 cash in each class. Closing date: Sept. 15th. See page 56 of the August issue for complete details, rules, and list of 169 prizes.

Candid Camera Corp. of America, 844 West Adams Street, Chicago, Illinois, announces a contest open to all amateurs. Write in 100 words or less your conception of the ideal type of miniature camera; the features you think it should have, its size and shape, and any other details which would go to make up your ideal camera. First Prize, Perfex Forty-Four camera, with *f* 2.8 lens, complete set of filters, synchronized flashgun and case. Second Prize, Perfex Forty-Four camera with *f* 3.5 lens and synchronized flashgun. Third, Fourth and Fifth Prizes, Perfex Forty-Four camera with *f* 3.5 lens. Closing date: September 15th.

The Kalart Company, 915 Broadway, New York City, announces a $250 prize contest for pictures taken with the Kalart Micromatic Speed Flash. Twenty-five awards of $10 each will be paid for winning pictures. Prints must not be smaller than 2¼ x 3¼ nor larger than 11 x 14. Entry blanks and contest rules at all dealers and direct from the Kalart Co. Closing date, Dec. 1, 1939.

Raygram Corp., 425 Fourth Avenue, New York, N. Y., announces the Ray-Del Picture Contest for pictures depicting *balance* in some manner, shape, or form, *e.g.*, a boy balancing on a fence. Closing date is Nov. 1, 1939. First Prize, $50; Second Prize, $25; ten awards each $5. Entry blanks and rules from your dealer or write Raygram Corp.

The New York State Nature Association, Albany, N. Y., will award a First Prize of $20; Second Prize, $10; and Third Prize, $5 for the best pictures projecting the spirit and beauty of wild life photographed in a natural environment. Closing date: Oct. 7th. Write Miss Alice Morgan Wright, 393 State St., Albany, N. Y., for regulations.

The Elgin Watch Co., Elgin, Ill., will award ten watches during the month of September for pictures taken in or of the Elgin Building at the New York World's Fair. Only one 11 x 14 print may be entered, accompanied by entry blank procurable at the World's Fair.

French Government Tourist Bureau, 61 Fifth Ave., New York City, announces a photo contest for pictures taken in France during the period June 15th-December 31, 1939. First Prize, $200; Second Prize, $75; Third Prize, $50; ten prizes of $10 each. The subjects include whatever the average American traveler finds most interesting in France; typical scenes of French life, whether city, village, or countryside, are desirable with a strong element of human interest. Entry blanks may be secured by writing or calling in person at the Bureau at the above address.

Goodyear Rubber Co. is conducting a contest open to all amateurs for the most beautiful or unusual photographs of the three Goodyear airships which are now operating over New York City. Pictures should be of the airships in the air against beautiful cloud backgrounds or in striking juxtaposition with the tops of buildings. Prints should not be smaller than 4 x 6 nor larger than 8 x 10. Complete data should accompany each print. Pictures will be returned only if accompanied by return postage. Entries should be submitted to Camera Contest, Room 4337, R.C.A. Building, Rockefeller Center, New York City. Closing date, Sept. 30, 1939.

Pittsburgh Garden Center, Schenley Park, Pittsburgh, Pa., announces a Garden Photography Contest open to everyone. Entries are grouped in four classifications: Black-and-white prints taken by adults; black-and-white prints by children under 16 years of age; color transparencies (2 x 2 slides only); and black-and-white prints, color transparencies (2 x 2 slides), and motion pictures taken at the 1939 Annual Chrysanthemum Show to be held in November at Pittsburgh. Cash prizes will be awarded in all classifications. Black-and-white entries by adults must be no smaller than 5 x 7 and not larger than 11 x 14. All prints must be mounted. Prints submitted by children may be any size. Closing date, December 6, 1939. Write to E. Eleanor Knight at the Pittsburgh Garden Center for entry blanks.

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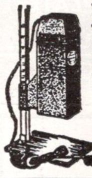

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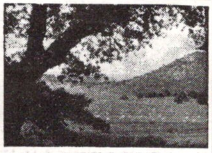

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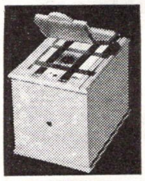

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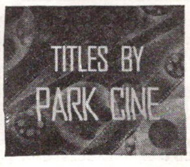

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Cat. No.		List	Net
S57	Leica D Black F3.5 Elmar	$135.00	$ 62.00
S58	Leica D Black F2.5 Hektor	140.00	69.50
S59	Leica F. Black F3.5 Elmar	152.00	81.00
S60	Leica F. Black F.2 Summar	204.00	90.00
S61	Leica F. Chrome F3.5 Elmar	159.00	89.50
S62	Leica F. Chrome F.2 Summar	210.00	98.00
S63	Leica G Chrome F.2 Summar	222.00	105.00
S64	Leica III B Chrome F.2 Summar	222.00	132.00
S65	Leica III B Chrome F1.5 Xenor	309.00	210.00
S66	Leica A Hugo Meyer F1.5		85.00

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Cat. No.		List	Net
S67	35mm Elmar F3.5	57.00	42.00
S68	28mm Hektor F6.3	69.00	45.00
S69	50mm Elmar F3.5	48.00	25.00
S70	50mm Hektor F2.5	63.00	27.50
S71	50mm Summar F2	99.00	54.00
S72	50mm Xenar F1.5	186.00	130.00
S73	73mm Hektor F1.9	180.00	79.50
S74	90mm Elmar F4	75.00	52.50
S75	105mm Elmar F6.3	58.50	34.50
S76	105mm Hugo Meyer Triplan F2.8	121.00	69.00
S77	200mm Telyt F4.5 with reflex housing	234.00	169.00
S78	3″ Hugo Meyer F1.5		95.00
S79	4″ Ross F5.5 in collapsible mount		35.00
S80	135mm Hektor F4.5	102.00	69.00
S81	135mm Elmar F4.5		57.00
S82	135mm Elmar F4.5 (uncoupled)		37.00

CONTAX CAMERAS

Cat. No.			List	Net
S81	Contax I (no slow speeds)	F2.8 Tessar		$ 67.50
	Contax I (no slow speeds)	F2 Sonnar		83.00
	Contax I (slow speeds)	F3.5 Tessar		65.00
	Contax I (slow speeds)	F2.8 Tessar	$163.00	72.00
	Contax I (slow speeds)	F2 Sonnar	190.00	89.50
	Contax I (slow speeds)	F1.5 Sonnar	273.00	97.00
S82	Contax II Chrome	F2.8 Tessar	204.00	114.00
	Contax II Chrome	F2 Sonnar	240.00	131.00
	Contax II Chrome	F1.5 Sonnar	327.00	160.00
S83	Contax III Chrome	F2 Sonnar	285.00	155.00
	Contax III Chrome	F1.5 Sonnar	372.00	169.00
S84	Contaflex	F2 Sonnar	285.00	145.00
	Contaflex	F1.5 Sonnar	372.00	195.00

CONTAX LENSES

Cat. No.			List	Net
S85	Tessar F8	2.8 cm	$ 72.00	$ 54.00
S86	Biogon F2.8	35 cm	144.00	96.50
S87	Tessar F2.8	5 cm	63.00	34.00
S88	Sonnar F2	5 cm	99.00	52.00
S89	Sonnar F1.5	5 cm	186.00	69.50
S90	Triotar F4	8.5 cm	93.00	68.50
S91	Sonnar F2	8.5 cm	213.00	110.00
S92	Sonnar F4	13.5 cm	120.00	82.00
S93	Tele Tessar F6.3	18 cm	183.00	98.00
S94	Tele Tessar	50 cm	525.00	275.00
S95	Sonnar F2.8	18 cm	195.00	
S96	Tele Tessar	30 cm	250.00	153.00
S97	Hugo Meyer Coupled, F.45	40 mm		45.00
S98	Primoplan F1.9	50 mm		45.00
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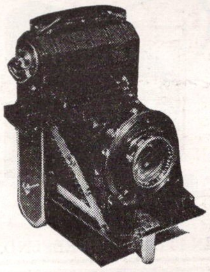

NEW

A FOTOSHOP Special Value, $26.50.

WITH COMPUR RAPID SHUTTER, $31.50.

In order to reduce our stock before inventory, we are offering hundreds of worthwhile bargain values at unusually low prices. You may buy with confidence and if not completely satisfied, return within 10 days for credit or immediate refund. TRADE IN YOUR PRESENT CAMERA.

35mm CAMERAS

Cat. No.		List Price	Sale Price
T67	MIDGET MARVEL, F 2		$ 37.50
T68	WELTI, F 2.9, Compur		27.50
T69	ARGUS, Model A	$ 10.00	6.50
T70	ARGUS, Model A F	12.50	8.00
T71	KODAK "35," F 5.6 Kodex	14.50	11.50
T72	DOLLINA O, Certar F 4.5	23.50	14.75
T73	MIDGET MARVEL, F 4.5 Vario		12.50
T74	DOLLINA O, Certar F 2.9, Compur		22.00
T75	MIDGET MARVEL, F 4.5, Compur		18.50
T76	JUBILLETTE, F 2.9	35.00	23.50
T77	MIDGET MARVEL, F 3.5 Compur		19.50
T78	RETINA I, Black Model		22.00
T79	BALDINA, F 3.5		27.00
T80	MIDGET MARVEL, F 2.9, Compur Shutter		29.00
T81	RETINA I, Chrome	48.50	34.50
T82	BALDINA, F 2.9		29.50
T83	WELTI, F 2.9 Cassar Compur Rapid		27.50
T84	WELTI, F 2.8 Tessar Compur Rapid		36.00
T85	WELTI, F 2 Xenon in Compur Rapid		42.00
T86	WATSON, F 2.9 Compur Shutter		26.00
T87	KODAK "35," F 3.5 Kodamatic Shutter		24.50
T88	UNIVEX MERCURY, F 3.5		19.50
T89	BALDINA, F 3.5		25.00
T90	PERFEX, F 3.5		15.95
T91	AGFA MEMO, F 4.5		19.00
T92	AGFA MEMO, F 3.5		27.50
T93	DETROLA G	9.95	
T94	DETROLA H	12.50	10.00
T95	DETROLA K	17.50	13.50

COUPLED RANGE FINDER 35MM CAMERAS

Cat. No.		List Price	Sale Price
T96	WELTINI:		
	F 2.8 Tessar		$ 65.00
	F 2 Xenon		69.50
T97	RETINA II:		
	F 2 lens	$120.00	78.50
	Kodak Bantam Special, F 2	87.50	54.50
T98	DOLLINA II:		
	F 2.9 Radionar	55.00	34.00
	F 2.8 Xenar	66.00	42.00
	F 2. Xenon	82.50	51.00
	F 2.8 Tessar	72.00	45.00
T99	ROBOT, F 2.8 Tessar	139.00	89.50
U1	BALDAXETTE, F 2.9		37.50
U2	ROBOT, Biotar F 2	184.00	125.00
U3	PERFEX 44, F 3.5	37.50	29.50
U4	SUPER BALDINA, F 2.9	59.50	34.50

CASPECO MINIATURE ENLARGER

- for 35mm. or half vest pocket.
- 5cm. F:4.5 lens.
- Universal Negative Carrier.
- New type positive lock (impossible to scratch negative).

NEW

A $45 value for only **$22.00**

WHILE THEY LAST

DOLLINA II

ALL NEW CAMERAS

with Radionar F2.9—Regularly $55.
Special $35.50
with Tessar F2.8—Regularly $72.
Special 46.75
with Xenon F2—Regularly $82.50
Special 52.75

SUPER SPORT DOLLY

With coupled range finder and built-in exposure meter

with Xenar F2.8—Regularly $75.
Special 48.75
with Tessar F2.8—Regularly $86.
Special 55.25
with Compur Rapid, $3.50 extra

VEST POCKET DOLLY

with F3.5 Lens, Compur Shutter.
Regularly $29.50. Special 18.25

WIRGIN MIDGET MARVEL

F2.9 SCHNEIDER RADIONAR LENS

In Prontor II Shutter. Speeds 1 second to 1/175th Time and bulb. Built-in delayed action timer tubular optical eye level view finder. Takes 16 pictures on Standard No. 127 Film.

Complete with Ever-Ready Case. NEW.. **$24.50**

F:2 SCHNEIDER XENON LENS

In Compur Rapid Shutter Speeds from 1 second to 1/500th. Helical focusing mount, tubular optical eye level view finder.

Complete with Ever-Ready Case. NEW.. **$42.50**

F:4.5 IN STELO SHUTTER

Speeds 1/25th, 1/50th, 1/100th, Time and Bulb. Full focusing 4.5 Victar lens. Tubular optical eye level view finder.

Complete with Ever-Ready Case. NEW.. **$14.95**

ARGUS FILTER KITS

Kit No. 27 consists of a SUNSHADE, YELLOW FILTER and PORTRAIT ATTACHMENT, ONLY $1.95

Your Equipment Accepted In Trade

Send us your equipment and we will immediately notify you what we will allow in trade. If our offer is not satisfactory, we will return your equipment to you prepaid.

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$50,000 INVENTORY CLEARANCE SALE

INCLUDING SLIGHTLY USED, RECONDITIONED, SHOPWORN, AND DEMONSTRATION MODELS

½ VEST POCKET AND VEST POCKET CAMERAS

Cat. No.		List Price	Sale Price
U70	Kodak Pupille, F3.5, Comp		$24.50
U71	Kodak Vollenda, F4.5		12.00
U72	Kodak Vollenda, F3.5 Compur		18.50
U73	Super Foth Derby with Range Finder	$ 45.00	22.50
U74	V. P. Makinette, Anticomar F3		17.50
U75	Wirgin Gevirette:		
	F4.5, Vario		12.50
	F2.9, Compur		17.50
U76	Foth Derby, F3.5	21.50	14.50
U77	½ V.P. and V.P., F4.5 Vario Shutter		12.50
U78	Foth Derby, F2.5	27.50	17.50
U79	½ V.P. and V.P., F3.5 Comp. Shutter		21.00
U80	V.P. Dolly:		
	F4.5 Victar, Vario Shutter	17.50	13.00
	F3.5 Corygon, Compur Shutter	27.50	19.50
V16	V P Agfa Billy O F:3.8 Compur		16.95
V17	V P Ihagee 3.5 Tessar Compur		17.50
V18	Kodak Bantom F:6.3		5.50

½ 120 and 120 CAMERAS

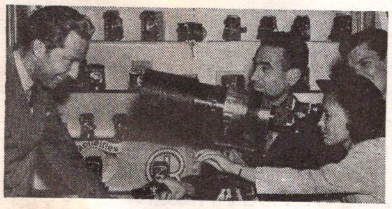
Cat. No.		List Price	Sale Price
U81	Welta Perle, F2.9 Cassar, Compur Shutter		24.00
U82	Weltax, F2.9 Cassar, Compur Rapid Shutter		37.00
U83	Kodak Duo 620, Black	52.50	26.75
U84	Weltax, F2.8, Xenar, Comp. Rapid Shutter		40.00
U85	Kodak Duo 620, Chrome	52.50	39.50
U86	Perle:		
	F4.5 Compur Shutter		18.00
	F2.9 Compur Shutter		25.00
U87	Precisa, F4.5 Prontor Shutter	31.50	17.50
U88	Super Sport Dolly, Trioplan F2.9	37.50	24.50
U89	Rifax, F2.9, in Comp. Shutter	48.50	28.50
U90	Super Sport Dolly, Xenar F2.8	52.50	36.75
U91	Super Sport Dolly, Tessar F2.8	62.50	37.50
U92	Precisa F2.9, Compur Shutter	45.00	24.50

COUPLED RANGE FINDER CAMERAS

Cat. No.		List Price	Sale Price
U93	Weltur:		
	F2.8 Xenar, Compur Shutter	102.00	65.00
	F2.8 Tessar, Compur Rapid Shutter	114.00	72.00
U94	Super Sport Dolly:		
	F2.8 Xenar in Compur Shutter.	75.00	47.50
	F2.8 Tessar in Compur Shutter	86.00	55.00
U95	Super Ikonta A, Special	118.00	87.50
U96	Super Ikonta B	160.00	98.50
U97	Rifax, F3.8, 2¼x3¼	53.50	34.00
U98	Super Ikonta C, F4.5 Tessar, 2¼x3¼	86.00	52.00
U99	Super Ikonta C, Special F3.5 Tessar 2¼x3¼	132.00	90.00
V1	Welta Solida, F4.5 Tessar		32.50
V2	Welta Solida, F4.5 Radionar	55.00	29.00
AE15	Voigtlander Bessa, Helomar F3.5, Compur Rapid	60.00	37.50
AE16	Voigtlander Bessa, Skopar F3.5, Compur Rapid	70.00	42.50
AE17	Voigtlander Bessa, Heliar F3.5, Compur Rapid	80.00	51.00

6x9 FILM PACK CAMERAS

Cat. No.	Camera	Bellows	Lens & Shutter	Net
R1	6x9	S.E.	Xenar 4.5 Compur A	$22.00
R2	6x9	S.E.	4.5 Vario	14.50
R3	K.W.	S.E.	Badionar 4.5 Pronto	14.50
R4	K.W.	S.E.	Trioplar 6.3 Vario	12.00
R5	Vag	S.E.	Voighter 6.3 Embezet	8.00
R6	6x9	S.E.	F6.8 Vario	7.50
R7	6x9	D.E.	4.5 lens Compur	19.50
		D.E.	Trioplar F3 Compur B	30.00
R8	Recomar 18	D.E.	K.A. F4.5 Compur B	27.50
R9	Ica	D.E.	F4.5 Tessar Compur A	29.50
R10	6x9	D.E.	Dogmar F4.5 Compur A	24.00
R11	6x9	D.E.	Tessar 4.5 Compur A	34.00
R12	6x9	D.E.	Tessar 6.3 Compur A	22.00
R13	Ica	D.E.	Dominar 4.5 Compur A	21.50
R14	Zeca	D.E.	Zecanar 4.5 Compur B	24.50
R15	Zeca	D.E.	Xenar 4.5 Compur A	26.00
R16	6x9	D.E.	Xenar 4.5 Compur B	28.00
R17	Maximar A	D.E.	Dominar 4.5 Compur A	27.50
R18	Maximar A	D.E.	6.3 Tessar Compur A	22.00
R19	Kawee	D.E.	Tessar 4.5 Compur B	29.50
R20	Zeca	D.E.	Tessar 4.5 Compur B	34.00
R21	Zeiss Sonnet Tropical Model	D.E.	Tessar 4.5 Compur B	34.50
R22	Voightlander Avus	D.E.	4.5 Lens Compur B	27.50
R23	Voightlander Bergheil		4.5 Heliar Compur A	35.00
R24	Ihagee coupled range finder	D.E.	4.5 lens Compur B	42.50
R25	BB	D.E.	2.9 Trioplen	32.50
R26	Bentzin Primar	S. E.	4.5 Compur B	21.50



Judy Starr gets a real close-up of Hal Kemp on her recent visit to the FOTOSHOP.

REFLEX CAMERA SPECIALS

Cat. No.		List Price	Special Price
P1	REFLECTA, F:4.5, Stelo		$ 12.50
P2	WIRGIN, F:3.5, Comp.		26.50
P3	ALTIFLEX, F:2.9, Compur		30.00
P4	ALTIFLEX, F:3.5, Compur Shutter		25.00
P6	PILOT 6, F:4.5	$ 21.50	10.00
P7	PILOT 6, F:3.5	27.50	16.50
P8	ALTISSA, F:4.5, Victar Stelo Shutter		9.50
P9	ALTISSA, F:4.5, Victar Prontor Shutter		12.50
P10	FOTHFLEX, F:3.5	49.50	27.00
P11	FOTHFLEX, F:2.5	65.00	39.50
P12	NATIONAL GRAFLEX Series I at —$37.00, Series II	87.50	56.00
P13	KORELLE REFLEX:		
	Model I, F:3.5, Cassar		49.50
	F:2.9, Radionar		56.00
P14	VITAFLEX, F:4.5, Lens in Stelo Shutter		9.50
P15	ROLLEIFLEX (Automatic)	152.50	99.50
P16	ROLLEICORD, F:3.5	77.50	54.00
P17	PRIMARFLEX, F:3.5; Tessar	175.00	95.00
P18	PRIMARFLEX, 16.5cm. with F:2.7 Tessar		135.00
P19	KORELLE REFLEX, F:2.8, Tessar II		99.00
P20	EXAKTA JR. F:3.5	75.00	45.00
P21	EXAKTA B, Black Model, F:3.5 Exaktar	85.00	59.00
P22	EXAKTA B, F:2.8 Tessar B	155.00	72.00
P23	VOIGHTLANDER BRILLIANT:		
	F:7.7 Special		9.85
	Voightar F:6.3		12.50
	Skopar F:4.5, Comp. Shutter		17.50
	Skopar F:4.5, Comp. Rapid Shutter		21.00
P24	PILOT, Biotar F:2		65.00
P25	PRIMARETTE, F:2.8 Tessar		54.00
P26	STANDARD ROLLEIFLEX		67.00
P27	4x4 ROLLEIFLEX, F:2.8 Tessar		72.50
P28	1A ROLLEICORD	57.50	42.50
P29	SUPER PILOT:		
	F:4.5	28.50	
	F:3.5	37.00	28.00
	F:2.9	45.00	33.00
P30	NIGHT EXAKTA B:		
	F:2 Biotar	310.00	135.00
	F:1.9 Primoplan	215.00	110.00
P31	KINE EXAKTA: F:2 Xenon		110.00
	F:3.5 Exaktar	140.00	
	F:3.5 Primotar	155.00	
	F:3.5 Tessar	170.00	100.00
	F:2.8 Tessar	195.00	115.00
	F:1.9 Primoplan	215.00	145.00
	F:2 Xenon	215.00	150.00
	F:2 Biotar	315.00	185.00
P32	EKAKTA JR., F:2.8		49.00
P33	EXAKTA, F:4.5		39.00
P34	IKOFLEX, F:3.5		69.00
P35	VITAFLEX, F:4.5		8.50
P36	F:2.9 Rad. Beirflex		53.50

EXTINCTION TYPE EXPOSURE METERS

Cat. No.		List Price	Sale Price
T43	IMPERIAL	$1.50	$1.35
T44	Pierce Still Meter	1.85	1.69
T45	Pierce Cini Meter	1.85	1.59
T46	F-R Cini Meter	1.00	.79
T47	Leudi Meter	2.15	1.65
T48	Expophet	1.75	1.38
T49	Instoscope	3.00	2.40
T50	Instocine	3.00	2.40
T51	Maxim Meter	1.75	1.38
T52	Univex Still Meter	2.10	1.65
T53	Univex Cine Meter	1.50	1.20

PHOTO-ELECTRIC EXPOSURE METERS

Cat. No.		List Price	Sale Price
T54	WESTON Universal	$19.95	$12.50
T55	WESTON Junior	15.50	10.50
T56	WESTON Cine	19.95	10.50
T57	WESTON Master	24.00	21.60
T58	G. E. Meter	19.50	13.95
T59	DeJur Amsco	10.50	8.00
T60	S. S. Photrix	17.50	13.50
T61	Mini Photoscope	14.75	10.00
T62	Electro Bewi		10.00
T63	Rhamstine		7.50
T64	Temphiphot		7.50
T65	Sixtus		10.00

9 x 12 FILM PACK CAMERAS

Cat. No.	CAMERA	BELLOWS	LENS & SHUTTER	NET
P37	9 x 12	S. E.	Trinar, F4.5 Ibsor	$12.00
P38	9 x 12	S. E.	Eurynar, F6.5 Ibsor	9.00
P39	9 x 12	S. E.	Voightar, F6.3 Ibsor	10.00
P40	9 x 12	S. E.	Novar, F6.3 Dervol	10.00
P41	9 x 12	S. E.	Talbotar, F6.3 Vario	9.00
P42	9 x 12	S. E.	Trinar, F6.3	8.00
P43	9 x 12	S. E.	Helios, F8	8.50
P44	9 x 12	S. E.	Triolar, F6.3	6.95
P45	9 x 12	D. E.	Eurynar, F6.8 Ibsor	15.00
P46	9 x 12	D. E.	Talbotar, F6.3 Vario	12.00
P47	9 x 12	D. E.	Correktar, F4.5 Ibsor	16.00
P48	9 x 12	D. E.	Skopar, F4.5 Ikor	16.00
P49	9 x 12	D. E.	Ernar, F6.3 Chronos	12.00
P50	9 x 12	D. E.	Trinar, F4.5 Ibsor	15.00
P51	9 x 12	D. E.	Trioplan, F4.5 Ibsor	16.00
P52	9 x 12	D. E.	Xenar, F4.5 Ibsor	16.50
P53	9 x 12	D. E.	Talbotar, F4.5 Vario	17.00
P54	9 x 12	D. E.	Doppel, F4.5 Rolex	29.50
P55	9 x 12	D. E.	Heckla, F6.3	10.00
P56	9 x 12	D. E.	Ysar, F4.5 Ibsor	17.50
P57	9 x 12	D. E.	F4.5 Comp. A	26.00
P59	B. B.	D. E.	F4.5 Ryadiona Comp. B.	35.00
P60	B. B.	D. E.	Trioplan, F4.5 Comp. B.	29.00
P61	B. B.	D. E.	Tessar, F4.5 Comp. B.	39.00
P62	B. B.	D. E.	Tessar, F4.5 Compur A.	32.00
P63	B. B.	D. E.	Eurynar, F4.5	17.50
P64	9 x 12	D. E.	Trioplan, F4.5 Comp. A.	21.00
P65	Avus	D. E.	F6.8 Comp. A.	17.50
P66	9 x 12	D. E.	Tessar F6.8, Compur A.	22.00
P67	9 x 12	D. E.	Ernon, F3.5	45.00
P68	9 x 12	D. E.	Cassar, F3.6, Compur A.	24.50
P69	Voightlander	D. E.	Skopar, F4.5, Compur A.	25.00
P70	9 x 12	D. E.	Dogmar, F4.5, Compur A	27.00
P71	Recomar	D. E.	K. A. F4.5, Compur B.	35.00
P72	B. B.	D. E.	Radionar, F4.5 Compur B	32.50
P73	9 x 12	D. E.	Xenar, F3.8, Comp. B	33.00
P74	Recomar	D. E.	Xenar, F4.5, Comp. B.	35.00
P76	Welta (coupled R. Finder)	D. E.	F4.5 Tessar, Comp. B.	57.00
P77	9 x 12	D. E.	Priminar, F4.5 Comp. A.	22.00
P78	9 x 12	D. E.	Kosmos, F4.5 Comp. A.	19.50
P79	9 x 12	D. E.	Heliar, F4.5 Comp. A	32.00
P80	9 x 12	D. E.	Anticomar, F4.2 Comp. A	34.00
P81	9 x 12	D. E.	Monoslar, Comp. A.	17.50
P82	Tropical Contessa Nettle		F4.5, Tessar, Comp. A.	34.50
P83	Maxinar (coupled Range Finder)		F4.5, Tessar, Comp. B.	59.00
P84	10 x 15 Orix		F4.5, Tessar, Comp. A.	39.00

116 & 120 CAMERAS

Cat. No.		Sale Price
V3	616 Plenax F:6.3	$15.00
V4	2¼x3¼ Agfa Ready Set	6.25
V5	Agfa Ready set	5.75
V6	2C Folding Brownie	3.95
V7	2C Kodak R R Lens	5.95
V8	3A Kodak R R Lens	6.50
V9	3¼x4¼ Kod. Spec. F:6.3 Lens	8.00
V10	No. 3 Kodak R R Lens	3.95
V11	3a Kodak, F:6.3 Lens	12.50
V12	3¼x4¼ Kodak Sr. F:7.9	5.95
V13	116 Voightlander Skopar F:4.5 Compur	22.50
V15	120 Ihagee Tessar 4.5 Comp. B	24.00

WHILE THEY LAST

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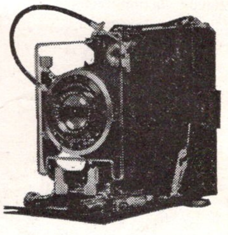

2¼ x 3¼ FILM PACK CAMERA

FULL DOUBLE EXTENSION BELLOWS

RISING AND SLIDING FRONT

Has Both Eye Level and Waist Level View Finder

With Tessar F4.5 Compur delayed action shutter.

New..........$34.50

IF NOT COMPLETELY SATISFIED, RETURN WITHIN 10 DAYS FOR REFUND.

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$50,000 INVENTORY CLEARANCE SALE

INCLUDES SLIGHTLY USED, RECONDITIONED, SHOPWORN, AND DEMONSTRATION MODELS

SPEED GRAPHIC AND GRAFLEX CAMERAS

Cat. No.		Sale Price
T22 2¼x3¼	Speed Graphic, Rev. Back, F4.5 Tessar Comp. A	$ 74.00
T23 2¼x3¼	Miniature Graphic, F4.5 B. & L. Tessar Comp. B	87.00
T24 3¼x4¼	Graphic, F4.5 Tessar Comp. A	84.50
T25 3¼x4¼	Graphic, F4.5 Tessar Comp. B with coupled Range Finder	107.00
T26 4x5	Graphic, F4.5 Skopar Compur A	69.00
T27 4x5	Graphic, F4.5 Tessar coupled R. F. Mendelson gun and case, special	129.00
T28 9x12	Linhof Technika, F4.5 Zeiss Tessar	175.00
T29 3¼x4¼	Rev. Back Series D Graflex, F4.5 Tessar	85.00
T30 3¼x4¼	Series B Graflex, F4.5 Kod. Anast	48.00
T31 3¼x4¼	Autograflex, F4.5 B. & L. Tessar	72.00
T32 4x5	Tele Graflex, F4.5 B. & L. Tessar	62.00
T33 3¼x4¼	Telegraflex, 4.5 Tessar	59.00
T34 4x5	Graflex, F4.5 Tessar (B. & L.)	42.50
T35 5x7	Series B, Graflex, F4.5 Kod. Anast	59.00
T36 4x5	Series B Graflex Rev. Back, F4.5 Kod. Anast	59.00
T36 5x7	Press Graflex, 5x8 B. & L. Lens	64.50
T38 5x7	Home Portrait Graflex, like new 12″ K. A. Lens. Reg. $375. Net	195.00
T39 3A	Graflex 5x7 B. & L. Tessar	35.00
T40 2¼x3¼	Graflex R. B. F4.5	49.00
T41 2¼x3¼	Graflex F4.5 Lens	32.50
T42	Contessa Nettel Dekrullo with Focal Plane and Compur Shutter 6″ Zeiss Tessar, like new. Reg. $250	95.00
T43 3¼x4¼	Series C Graflex, F2.5. Cooke Lens	115.00

FOCAL PLANE TYPE FILM PACK CAMERA SPECIALS

Cat. No.		Sale Price
S46	V. P. Erneman Sportsman 4.5	$19.50
S47	Contessa Nettel Focal Plane & Compur Shutter 6″ 4.5 Tessar	95.00
S48	WELTA Focal Plane, 9x12cm. 6″ Schneider Xenar F:4.5, Compur (A shutter as well as focal plane shutter)	65.00
S49	Ica Focal Plane, 9x12cm. 6″ Zeiss Tessar F:4.5	39.00
S50	Brooks Focal Plane, 9x12cm, 6″ Schneider Zenar F:3.5	45.00
S51	Tropical Erneman Focal Plane, 9x12cm, Ernestar F:2.7	65.00
S52	Welta Focal Plane, 9x12cm. 6″ Schneider Xenar F:3.5 in compound shutter (additional)	75.00
S53	Erneman Sportsman Focal Plane, 6.5x9cm, Erneman Anastigmat 12cm. F:3.5	39.00
S54	Erneman Sportsman Focal Plane, Ernostar F:2.7	69.00
S55	Goerz Focal Plane, 9x12cm. 6″ Goerz Dogmar F:4.5	35.00
S56	6″ Goerz Celor, 5x7″, 18cm, F:4.8	40.00
U54	Contessa Nettel 5x7 Tessar 4.5 21 CM	59.00
U66	9x12 Ihagee Focal Plane Tessar 3.5 135 MM	95.00
U67	9x12 Erneman Sportsman Tessar 4.5 6″	55.00
U69	6x9 Ica Plate V.F.P. Tessar 4.5 12 CM	34.50

LARGER REFLEX TYPE CAMERAS

U42	Ica Reflex 9x12 Tessar 4.5—15 CM	$ 30.00
U43	Ihagee Reflex 9x12 Trioplar 4.5—15 CM	40.00
U45	Mentor 10x15 Zeiss Tessar 2.7 165 CM	95.00
U46	Mentor 6x9 Zeiss Tessar 4.5 12 CM	45.00
U47	Miroflex 9x12 Zeiss Tessar 2.7 165 CM	140.00
U49	Popular Pressman 9x12 Tessar 2.7 165 CM	110.00
U50	Popular Pressman 3¼x4¼ Cooke Butcher 4.5—5¾″	35.00
U51	Ica Reflex 3¼x4¼ Tessar 4.5 15 CM	47.50
U52	Ensign Special Reflex 6x9 Tessar 4.5 135 CM	42.00
U53	Ihagee Reflex 9x12 Tessar 4.5 165 CM	85.00
U55	Ihagee Reflex 6x9 Tessar 4.5 15 CM	65.00
U56	Erneman Reflex 10x15 Exhotar 4.5 6½″	30.00
U57	Thorton Special Ruby Reflex (less lens) 6x9	40.00
U58	Thorton Pickard 3¼x4¼ Tessar 4.5 15 CM	35.00
U59	Popular Pressman 3¼x4¼ Tessar 2.7 165 CM.	90.00
U60	Mentor 9x12 Tessar 4.5 15 CM	50.00
U61	9x12 Popular Pressman Butcher 4.5 5¾″	40.00
U62	9x12 Thorton Pickard Jr. Taylor H. Cooke 4.5 6″	50.00
U68	3¼x4¼ Contessa Nettel Tessar 4.5 15 CM	85.00

Ben Grauer N.B.C. announcer for Kay Kayser and Walter Winchell inspects a Robot camera at FOTOSHOP.

35 MM ENLARGERS

Cat. No.		List Price	Sale Price
P85	Optex	$ 15.50	
P86	Elwood A M	30.00	
P87	Federal 505	9.75	$ 8.95
P88	Argus	12.50	10.00
P89	Praxidos for Leica	32.50	24.00
P90	Praxidos 4x4cm	32.50	24.00
P91	Praxidos for Contax	32.50	24.00
P92	Caspeco	45.00	20.00
P93	Sunray	32.50	23.50
P94	Grant	49.50	24.50
P95	Ideal	44.50	33.50
P96	Praxidos Autofocus for Leica	47.50	36.00
P97	Valoy	49.50	35.00
P98	Omega A	48.00	33.00
P99	Focomat	84.00	67.00
T1	Argus E A E	17.50	14.00
T2	Case Enclosed Omega	117.00	65.00

OTHER ENLARGERS

T3	Elwood 5x7	$30.00	$24.00
T4	Sunray Craftsman 6x9	16.50	13.25
T5	Eastman Home Enlarger	16.50	13.50
T6	Elwood BM (no lens)	18.00	14.00
T7	Federal 120 2¼x3¼	17.95	15.95
T8	Elwood BM with lens 1¼x2¼	29.00	24.00
T9	Praxidos 6x6	42.50	27.50
T10	Caspeco 6x6	59.00	27.50
T11	Caspeco 6x9	84.00	39.50
T12	Dako (no lens) 2¼x3¼	59.50	29.00
T13	Solar 6x6 or 6x9 cm	49.50	33.00
T14	Sunray Filmaster to 2¼x3¼	57.50	39.00
T15	Lucky 2¼x3¼	65.00	30.00
T16	Multifax to 2¼x3¼	89.50	63.00
T17	Laborant to 4x5	132.50	90.00
T18	Omega B	65.00	45.00
T19	Kalor	49.00	30.00
T20	4x5 Omega	175.00	115.00
T21	Case Enclosed Omega	135.00	70.00

BINOCULAR SPECIALS

T41	Leitz Binocular Binex 8x30	$ 54.00
T42	Bernard Binocular 8x26	14.95
T43	LaGrande Binocular 8x30	17.50
T44	Opplem Binocular 8x32	32.50
T45	Wollensak Binocular 8x30	32.00
T46	C. Z. Silvermar 6x30	42.00
T47	Leitz 12x60 Mardocit	110.00
T48	C. Z. Sportur 6x24	40.00
T49	C. Z. 8x24 Turoctum	39.00
T50	C. Z. Delactem 8x40	95.00
T51	C. Z. Binoctem 7x50	105.00
T52	C. Z. Telarem 18x50	135.00
T53	Hensoldt 6x24	39.00
T54	Hensoldt 6x50	110.00
T55	Hensoldt 6x42	65.00
T56	Hensoldt 10x56	145.00
T57	La Fayette 8x30	13.95
T58	Leitz Bidox 6x30	42.50
T59	Carl Zeiss 8x30 Deltrintem	65.00
T60	Foch 10x35	27.50
T61	Zeiss 8x24 Opera Glass Turita	65.00
T62	Oppelman 8x40	32.00

LENS SPECIALS

Hundreds of other bargains available. If the lens you want is not listed, write us for quotations.

TWO-THREE-FOUR INCH LENSES

Cat. No.		List Price	Sale Price
N1	2″ Componar, F3.5	$ 18.50	$ 14.00
N2	1½″ Dallmeyer Pentac, F2.9	35.00	20.00
N3	51mm Heliar, F4.5	25.00	15.00
N4	2″ Vario, F4.5	15.00	5.95
N5	Wollensak Velostigmat, F3.5	20.00	10.00
N6	3″ Zeiss Tessar, F2.8	42.00	19.00
N7	3½ Velostigmat, F4.5	20.00	10.00
N8	3″ Kynor, F2.9	28.00	10.00
N9	3″ Velostigmat, F4.5	18.50	10.00
N10	12.5cm Goerz Dogmar, F4.5	38.00	20.00
N11	10.5 Unifocal Ibsor, F4.5	17.00	10.00
N12	10.5cm Monox Vario, F6.8	17.00	8.00
N13	12cm Zeiss II B Tessar, F6.3	31.00	19.00
N14	10cm Dagor Comp. A., F6.8	45.00	30.00
N15	10.5cm Heliar Comp. A., F4.5	40.00	20.00
N54	55mm Topaz, F2.9	20.00	15.00
N55	Goerz Hypar, F3.5	25.00	15.00
N56	Gewironar 2″, F4.5	15.00	9.00
N57	82mm Laack Anss. Vario, F4.5	15.00	8.00
N58	10.5cm Helioplan Pronto, F6.8	14.00	7.00

FIVE-SIX-SEVEN-INCH LENSES

Cat. No.		List Price	Sale Price
N16	13.5cm Kosmos Comp B., F4.5	$ 40.00	$ 22.00
N17	13.5 Zeiss Tessar CompA., F4.5	47.00	29.00
N18	13.5 Zeiss Tessar Comp A., F3.5	80.00	54.00
N19	13.5 Skopar Isbor, F4.5	30.00	16.00
N20	13.5 Talbot Anas. Vario, F4.5	25.00	12.00
N21	Cooke Anastigmat Bbl., F4.5	40.00	25.00
N22	6½ Dogmar sunk, F4.5	50.00	30.00
N23	15cm Zeiss Tessar sunk, F4.5	55.00	25.00
N24	6″ Velostigmat, Optimo, F6.8	55.00	12.00
N25	6½″ Goerz Dagor, F6.8	70.00	30.00
N26	6⅛ B&L Zeiss Double Protar, 11 3/16	99.00	50.00
N27	6″ B&L Zeiss Tessar Compound, F6.3	49.00	18.00
N28	16.5 Zeiss Tessar focusing F2.7	130.00	65.00
N29	168mm Goerz Celor focusing, F4.8	70.00	35.00
N30	7½ Seneca R.R. Conv. Shutter, F8	20.00	12.00
N31	7″ Velostigmat Auto Shutter, F4.5.	48.00	25.00
N32	18cm Zeiss Tessar sunk, F4.5	65.00	35.00
N33	7½-6½ Graf-Variable, F3.8	70.00	40.00
N34	7½″ Cooke, F3.5	125.00	65.00
N59	6½ Zeiss Tessar Comp. A, F4.5	60.00	35.00
N60	168mm Goerz Celor Focusing, F4.8	70.00	35.00
N61	7½″ Turner Reich Convertible	80.00	35.00
N62	7½″ B & L Zeiss Tessar	90.00	32.00

EIGHT INCH LENSES AND LARGER

Cat. No.		List Price	Sale Price
N35	Cooke A, F5.6	$ 80.00	$ 40.00
N36	8¼″ Goerz Celor, F5	70.00	30.00
N37	8¾″ Verito Regular Shutter, F4	50.00	22.00
N38	12″ Dagor, F6.8	212.00	80.00
N39	36cm Heliar, F4.5	245.00	95.00
N40	10″ Kodak Anas., F4.5	110.00	70.00
N41	20″ E F RR, F1.8	50.00	20.00
N42	10⅝″ Plasmat Hugo Meyer, F4.4	310.00	100.00
N43	14½ P & S. Studio, F3	95.00	40.00
N44	24″ Karl-Morgen Process, F9	200.00	85.00
N63	8¼″ Xenar, Sunk, F3.5	100.00	60.00
N64	8¼″ Dagor Volute, F6.8	100.00	45.00
N65	20″ B & L Tessar, F6.3	267.00	75.00
N66	10¾″ Goerz Celor, Series 1B No. 5, compound shutter, F5	186.00	65.00
N67	12″ Wollensek Velostigmat	120.00	45.00
N68	12″ Zeiss Tessar, F3.5	348.00	150.00

TELEPHOTO AND WIDE ANGLE LENS

Cat. No.		List Price	Sale Price
N45	12″ Dallmeyer Dallon, F6	$ 90.00	$ 60.00
N46	11″ Ross Teleross 3¼x4¼, F5	110.00	45.00
N47	Variable focus Telepeconar, F4.5	70.00	30.00
N48	12cm Angulon 3¼x4¼, F6.8	56.00	40.00
N49	5x7 Series III Wollensak Ex. Wide Angle, Betax, F1.25	47.00	22.00
N50	12cm Plaubel Orthar 4x5, F6.8	50.00	20.00
N51	6½″ Cooke W.A. F5.6	100.00	50.00
N52	6½x8½ Wollensak Ser III Optimo 8x10, F9.5	54.00	25.00
N53	4⅜″ Dagor Wide Angle Comp. B	66.00	45.00
N69	Extreme W. A. Hypergon Covers to 12x16″, F22	252.00	98.00

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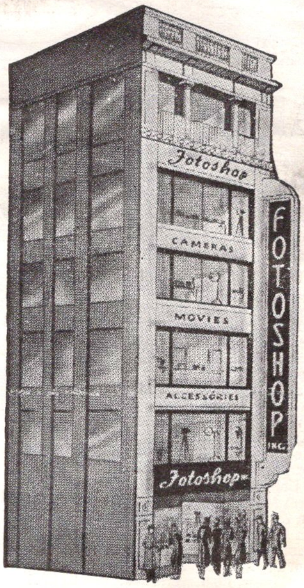

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FOTOSHOP DE LUXE DEVELOPING SET $4.65

Regular $6.65 value. Contains Ruby bulb, 6 tubes, Universal developer, 3—4x6 enamel trays, 1 lb. acid fixer, 20 sheets 3¼x5½ print paper, glass stirring rod, 3¼x5½ metal print frame, thermometer, 8 oz. graduate, exposure record guide, 2 stainless steel film clips, 2 print tongs, film washer, 2—10x14 squeegee plates, 4″ de luxe rubber roller, 3 oz. squeegee polish, flannel cloth, 16 page book of instructions.
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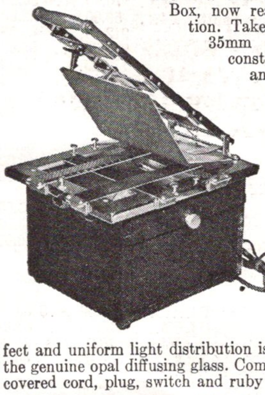
Takes from 35mm to 5x7 negatives.



The new Kaiko all-metal Print Box, now ready for distribution. Takes negatives from 35mm to 5x7″, solidly constructed of steel and brass. All moving parts heavily chromium plated. Guide bands for masking etched in white on black metal. Has convenient side door for dodging and print control. Perfect and uniform light distribution is assured through the genuine opal diffusing glass. Complete with rubber covered cord, plug, switch and ruby safety lamp.

SENSATIONALLY PRICED AT ONLY $11.95

When in New York be sure to visit FOTOSHOP's six story building at 18 E. 42 St., one block west of Grand Central Station. Here you will find one of the most complete assortments of cameras, photographic materials and accessories that may be found anywhere in the country.

Housed here is also the FOTOSHOP INSTITUTE OF THE CAMERA, club rooms, darkrooms and studio accommodations for the general public. The INSTITUTE has recently announced a new policy which enables camera fans to secure personal individual instruction in any photographic subject by appointment, day or evening. Hundreds of camera enthusiasts have taken advantage of our darkroom and studio facilities. The personal instruction plan has received favorable comment from press and public. Here one may take as many lessons as desirable without the necessity of rehashing such knowledge that he may already possess.

Complete color courses are available at the INSTITUTE covering every phase of natural color photography whether it be lighting, photographic methods, Carbro, Chromotone, or wash-off relief. The Devin Color camera and other cameras are available for use by students. Any of these subjects are taught here by efficient instructor in as condensed a form or in as complete a course as is desired, by the student. One may now take advantage to brush up on some little points of photography in which he may be a bit vague at a very slight cost.

PURCHASERS OF PHOTOGRAPHIC EQUIPMENT AT FOTOSHOP ARE ENTITLED TO FREE INSTRUCTION IN THE PROPER USE OF SUCH EQUIPMENT AT OUR INSTITUTE.

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with Universal Swivel Top. All metal. Nickel finish. Rubber tipped legs (removable). 10 inches high. ONLY.......................................$1.25

Daylight Film Winder *$2.89*

(Formerly sold at $10.00)

For loading your 35mm film spools from bulk film. A necessity for the Minicam owner. Has a capacity of 100 feet of film—sufficient for 20 loads of 36 exposures each. You can load a cartridge in less than a minute WITHOUT THE AID OF A DARKROOM OR CHANGING BAG. Streamlined case of moulded bakelite. All metal parts chromium plated. Small and light in weight. A BARGAIN AT ONLY $2.89.

ADJUSTABLE DEVELOPING TANK

with new Fool-Proof Snap Lock Cover that makes it absolutely Light Proof

A durable and chemical-resistant developing tank, molded of genuine bakelite, spiral feed reel adjustable to all sizes from 36 exposures mm to No. 116 (Agfa No. D6) inclusive. Superior in design, construction and finish. Cover made of red bakelite while the tank itself is black. This combination of color distinguishes this Adjustable Tank from all others now on the market. Has a wide funnel for filling and side vent for pouring. The center core is hollow to allow the insertion of thermometer. Each tank is furnished complete with an Agitator Rod. NOW ONLY.... **$1.89**

PLEASE GIVE CATALOG NUMBER WHEN ORDERING

Bea Wain shoots radio announcer, but the willing victim is hubby André Baruch and the weapon a harmless Leica obtained at "Fotoshop."

NOW AVAILABLE
THE DEVIN TRICOLOR CAMERA

6.5 x 9 cm. Makes a set of separation negatives by means of three exposures on the same subject, through red, green and blue-violet filters.
Here is a professional type two mirror camera expressly designed for the serious amateur and professional photographer. Produces the same technical perfection achieved by leading advertising and illustrative photographers. THE MOST ADVANCED TRICOLOR CAMERA EVER BUILT. NOW AVAILABLE AT THE SPECIAL PRICE OF ONLY......................... **$365.00**

(DEVIN TRICOLOR cameras are also available from Fotoshop on rental basis and for the use of students at the FOTOSHOP INSTITUTE.)

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2¼x3¼ down to 35MM
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CINE LENS SPECIAL

Cat. No.		List Price	Sale Price
V19	1″ F1.5 Hugo Meyer	$ 84.00	$ 40.00
V20	15 mm F1.5 Dallmeyer	84.00	58.00
V21	1″ F2 Schneider Xenon	60.00	20.00
V22	1″ F3.5 Cooke Fixed Focus	25.00	8.00
V23	1″ F2.9 Dallmeyer Fixed Focus	30.00	12.50
V24	1″ F2.9 Dallmeyer Focusing	42.50	25.00
V25	1″ F1.8 Cooke, new style mount	84.00	42.00
V26	1″ F1.5 Hugo Meyer	84.00	45.00
V27	1″ F1.5 Dallmeyer	84.00	58.00
V28	15mm F2.7 Wollensak	25.00	15.00
V29	15mm F2.7 Eastman Kodak and Adapter	55.00	42.00
V30	1″ F1.9 Eastman Kodak Lens C Mount	60.00	38.00
V31	1″ F1.9 Eastman Kodak for Simplex	60.00	38.00
V32	1½″ F1.5 Dallmeyer	91.00	35.00
V33	1″ F1.9 Dallmeyer	84.00	25.00
V34	1″ F2.7 Wollensak	25.00	15.00
V35	1″ F3.5 Cooke Focusing		17.50
V36	2″ F1.5 Wollensak	87.50	48.00
V37	2″ F3.5 Cooke	67.00	42.00
V38	2″ F1.5 Dallmeyer	80.00	48.00
V39	3″ F2.9 Dallmeyer	85.00	50.00
V40	3″ F4.5 Eastman Kodak and attached Mount for K	45.00	30.00
V41	3¾″ F3.3 Cooke	91.00	50.00
V42	3¾″ F3.3 Dallmeyer	90.00	47.50
V43	2½″ F2.7 Eastman Kodak and Adapter	60.00	45.00
V44	4″ F2.7 Eastman Kodak and Adapter	75.00	57.00
V45	4″ F4 Wollensak	57.50	41.00
V46	6″ F4 Wollensak	75.00	53.00
V47	6″ F5.5 Cooke	91.00	50.00
V48	6″ F4.5 Cooke	126.00	88.00
V49	1″ F1.5 Wollensak	50.00	27.00
V50	1″ F2.9 Hugo Meyer	45.00	30.00
V51	2″ F3.5 Eastman Kodak and Adapter	45.00	33.50
V52	1″ F1.5 for Bell & Howell 8		68.00
V53	1″ F1.4 Leitz Hektor	98.00	69.00
V54	15mm F2.5 Cooke Fixed	51.00	35.00
V55	15mm F2.5 Cooke Focusing	64.50	51.00

SEE PAGE 85
FOR ANNOUNCEMENT OF FOTOSHOP'S NEW 128 PAGE ALMANAC - CATALOG. NOTHING LIKE IT EVER BEFORE PUBLISHED.

SPECIAL SALE

KEYSTONE 16MM CAMERA AND PROJECTOR

SAVE $16.50

KEYSTONE 16mm Camera F3.5 lens regular price $29.95

KEYSTONE 300 watt projector regular price $35.00

BOTH FOR ONLY $49.50

These are brand new cameras and this special price is available only because of overstock of these items.

TRADE IN YOUR PRESENT EQUIPMENT—TAKE ADVANTAGE OF THIS SENSATIONAL MONEY SAVING OFFER. After our present supply is exhausted regular prices will prevail.

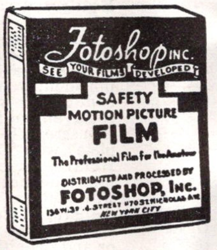
MOVIE CAMERAS

Miss Sally Clark, sister of Mrs. John Roosevelt receives instructions on how to operate her movie camera from a member of the FOTOSHOP institute.

16MM CAMERAS

Cat. No.		List Price	Sale Price
V69	Model E Cine Kodak	$ 39.50	$ 30.00
V70	Model K Cine Kodak	80.00	60.00
V71	Magazine Cine Kodak	117.00	88.00
V72	Cine Kodak Special	417.50	315.00
V73	Cine Kodak B F:1.9		47.00
V74	Cine Kodak B F:3.5		22.50
V75	Cine Kodak BB F:1.9		45.00
V76	Keystone:		
V77	B1 F:3.5 lens	29.50	21.00
V78	A3 F:3.5 lens	35.00	24.00
V79	A7 F:2.7 lens	44.50	32.00
V80	A7 F:1.5 lens	71.00	49.00
V81	A3 F:1.5 lens	67.50	45.00
V82	Victor (Like New):		
V83	Model 3 with 1″ F:2.7 Victor	84.50	51.00
V84	Model 4 with 1″ F:1.5 lens	145.00	92.00
V85	Model 5 with 1″ F:2.7 Victor	172.00	105.00
V86	Bell & Howell Cameras (Like New):		
V87	70D-F:3.5 Cooke		105.00
V88	Mag. 141-1.5 Cooke	160.50	122.00
V89	Mag. 121-F:1.5 Cooke		95.00
V90	70C-Turret-F:3.5 Turret		55.00
V91	70A-F:3.5 Cooke		35.00
V92	Bolex (Like New):		
V93	With F:1.5 Dallmeyer lens		195.00
V94	Zeiss Movikon	385.00	250.00
V94A	Zeiss Magazine Camera, F2.7		125.00
V95	Simplex F:3.5 lens		20.00
V96	Ensign Camera (with rewind feature and F:2.6 lens)		62.00

A NEW FASTER MOVIE FILM



Packed
for All Cameras

**FOTOSHOP
16mm FILM**

	Weston	Tungsten	Price (100′)
ORTHO	12	......	$2.39
RAPID PAN	22	14	3.50
SUPER EXPRESS PAN	80	50	5.50

**FOTOSHOP
8mm FILM**

	Weston	Tungsten	Price (25 ft. Double 8)
SEMI-ORTHO	14	....	$1.30
PAN	24	16	1.65
EXPRESS PAN	80	50	2.00

LOW PRICES INCLUDE PROCESSING
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8MM CAMERAS

Cat. No.		List Price	Sale Price
V98	8.20 with F:3.5 lens	29.75	22.50
V99	8.25 with F:2.7 lens	42.00	31.50
O1	8.60 with F:1.9 lens	67.50	52.00
O2	Keystone:		
O3	K8 with F:3.5 lens	27.95	19.50
O4	K8 with F:2.7 lens	36.00	26.50
O5	K8 with F:1.9 lens	60.00	44.00
O6	Emel-5 speeds, motor or hand drive, rewind, turret head, F:1.9 lens		118.00
O7	Univex with F:5.6 lens		6.50
O8	Bolex 1.9 lens		192.00
O9	Ditmar with rewind & coupled Exposure meter with case, F1.8	165.00	95.00

16MM PROJECTORS

Cat. No.		List Price	Sale Price
O10	EE F:2.5 lens 500 W	$ 59.50	44.00
O11	G F:1.6 lens 750 W	125.60	94.50
O12	Keystone:		
O13	D64 200 Watt	35.00	25.00
O14	A72 300 Watt	44.50	31.50
O15	A75 500 Watt	55.00	37.00
O16	A81 750 Watt without still		45.00
O17	A81 750 Watt with still	69.50	52.00
O19	Bell & Howell JJ (all geared)		132.00
O20	129D		160.00
O21	Bell & Howell ST 750 Watt		100.00
O22	Bell & Howell S 500 Watt		95.00
O23	Bell & Howell LL (Gear Driven)		135.00
O24	Ampro (Like New, with case): KD 750 W F:1.65 lens automatic pilot		102.00
O26	Victor:		
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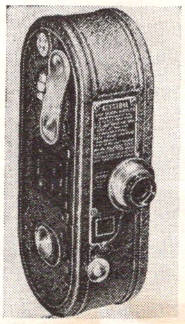

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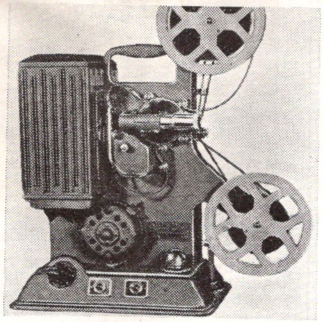

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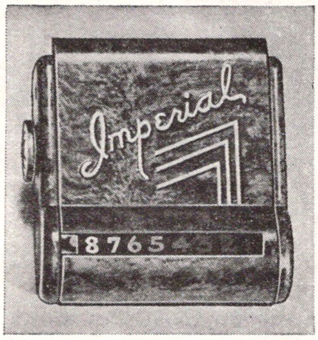

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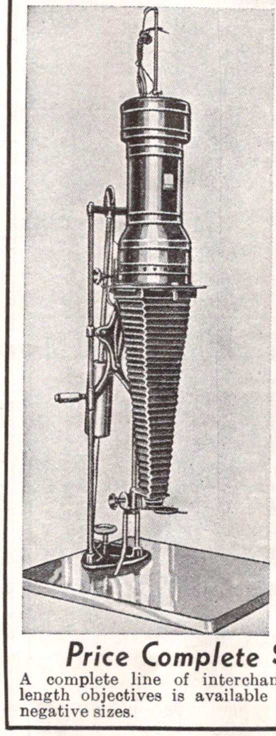

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Hunting with Flashpowder

(Continued from page 29)

¾ ounce of normal grade flashpowder in each of twelve to eighteen ordinary cardboard pill boxes. A fuse is fastened to each and the boxes are then double-coated with paraffin. Two boxes are used for each flash. These are fastened to the cross-bars of two upright sticks near the bow of the boat, and wired to a battery. A wire from each pair of separate flash boxes leads to an ordinary door-bell push button, one of which is held in each hand.

A recoil device, developed by the late Wm. Nesbit of New York City, is attached to each end of the cross-bars under the box of flashpowder, and from this device a standard 4-foot cable release is attached to the camera shutter. This ingenious system corrects the faults of previous experimental equipment.

Roberts describes the action of the apparatus as follows: "When the button is pressed the battery fires the fuses, igniting the powder. The *recoil* makes contact with the end of the cable release which trips the shutter. The device permits adjustment for the power of this contact and the shutters are synchronized, of course, with the peak of the flash."

Holding one flash button in each hand, Roberts sits directly behind the two cameras. An assistant paddles the boat, and this is one of the most delicate parts of the operation. At the slightest sound, such as the merest splash of a paddle, or the grating of the bottom of the boat on pebbles or on a rock, the deer scrambles for the safety of the trees before the 25-foot range is reached. And 25 feet is pretty close!

Assuming the approach has been accomplished noiselessly, the button leading to the camera previously set at 1/200 second is pressed first. A picture results, but the flash startles the deer. The flash also temporarily blinds the men, but although he cannot see, Roberts knows what is taking place and approximately 2 to 3 seconds later he presses the second button. By using the second camera in this way he has obtained some of the most remarkable action pictures of deer ever taken.

Roberts says that a dark, cloudy night, without moon or stars being visible, is essential for this work. He also dispels a commonly-held notion that the light attracts or fascinates deer. His purpose for the light is primarily to conceal the boat and to make the deer visible. A bright light frightens deer; and if through previous experience they associate a rifle shot with that light on the water they scamper at once. Very little light is necessary on a dark night.

These pictures are taken during the summer months. The deer are then feeding heavily after the long winter of food scarcity; the flies are bad in the woods, and the hunters are not out. Many people wonder how deer can be approached so closely without getting the scent, because a hunter is always careful in the daytime to approach against the wind. Roberts says that the damp atmosphere at night does not seem to carry the scent and that this angle does not have to be considered.

Deer make good subjects to shoot at—with a camera. Those who have tried it will fully appreciate the value of the pictures accompanying this article. The illustrations also show that Roberts has been equally successful with other and smaller types of game. Hunters will immediately recognize the amount of ingenuity, time, and patience required to get the daylight picture of the loon on its nest.

This was accomplished in the following manner. A blind, consisting of a framework of dark canvas, was constructed on the front of a duck boat. The boat was anchored several hundred feet from the nest, while Mother Loon was away, and left there for a day. The next day it was moved about 30 feet closer to the nest and again anchored and left for a day. This procedure was repeated each day for about a week until the boat was close enough for good pictures. Then an assistant rowed Roberts to this blind and left him there until the loon returned, when several extraordinary pictures of the wary bird were taken.

Roberts obtains "self-pictures" of small animals and birds at night by setting up his camera during the day. In some cases he uses one of the flash and camera units as described for deer. In any case suitable bait is located at the point of focus and a pull on the cord to which the bait is attached sets off the flash and trips the shutter. Roberts has not used the modern flashbulbs and guns but says he sees no reason why they should not be adapted to this type of work. It is a matter of suiting the intensity of the flash to the speed of the lens and the film, a ratio which can easily be determined by a few experimental shots.

Many cash prizes and honors, and much enjoyment have come to Hobart Roberts as a result of his hobby. His work has been shown internationally, and is familiar to naturalists everywhere. It should be an inspiration to all who share Roberts' love of the wilderness and its denizens. It seems entirely possible that similar work can be done using modern flashbulbs, either with or without synchronizing equipment. But skill in stalking the quarry comes only with long practice, and obviously this factor plays a very important part in Roberts' success.—

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(Continued from page 38)

of large circulation, important catalogs, mailing pieces, etc.; having quite widespread distribution; spot news of more than passing interest; also for cover pages in material defined in Class B. Twice the price of material for Class B, or, let us say, $10.

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Class E: For exclusive use and outright sale of photograph and negative where photograph is to be featured in full-page advertising to run in one or more publications of nation-wide, general circulation; red-hot spot news of quite exceptional interest. Twice the price of material under Class D, or $100.

Class F: Special work by "big name" photographers, cover pages for publications such as those listed above, and other material of the highest class for exclusive use, which none but the chosen few can ever hope to reach; exclusive shots of such spot news as Hindenburg disaster or Ward's leap. (Let's not bother with putting in any figures at all on this.)

No doubt many will consider these proposed prices outrageously high; others will consider them much lower than what they have been led to believe such photographs often bring. They are offered as a guide to the average free-lance photographer, who, unless he is not only an exceptionally good photographer but also a person of some experience or knowledge of the publishing business, will seldom, if ever, have an opportunity to crash the upper brackets. If they have no other value, they will give an idea of the proportional rates for various uses, and will at least provide some indication to beginners and the inexperienced who have not the faintest idea of what basis to use in making quotations.—▶

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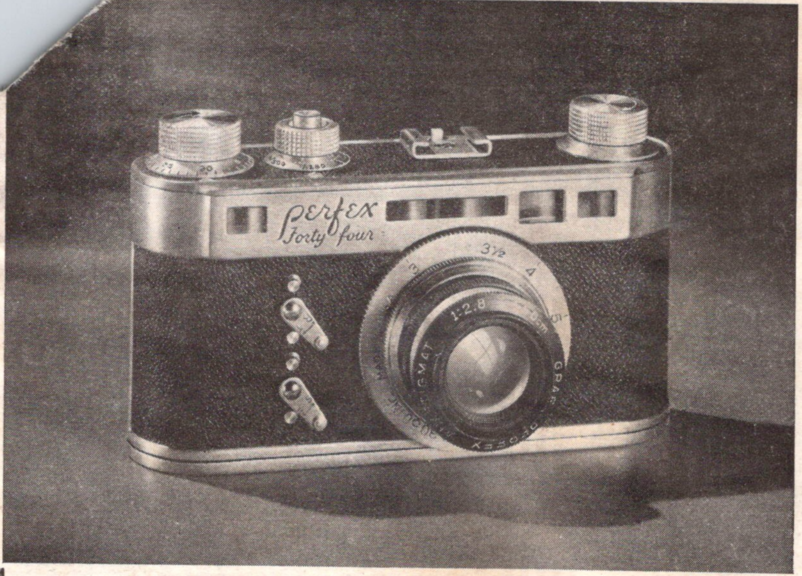
Get away from tiresome everyday realities for awhile. Follow these two adventurers into a new world of imagination and entertainment. Read these entrancing stories of the future, based on today's science. Allow yourself to relax with an entertaining means of escape from the humdrum of daily existence with the

NOVEMBER ISSUE

AMAZING STORIES



Perfex Forty-Four

35 mm. MINIATURE CAMERA

The Ultimate choice of the expert!

- **With coupled range finder for automatic focusing.**
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WITH F3.5 LENS	WITH F2.8 LENS
$37.50	$47.50

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PERFEX VU-or-PROJECT

COMBINATION FILM SLIDE VIEWER AND PROJECTOR

Now, with one unit you can view or project your film slides, color positives, etc. It will bring out in sparkling detail the full beauty of your slides. Among its unusual features are automatic slide alignment and ejection, high ratio lever focusing—cool operation. Highly efficient light and optical system.

AS A VIEWER

Ground glass viewing screen measures 6x6 inches—provides a six inch image on both vertical or horizontal slides. Automatic shutter blacks out screen, eliminating the distracting flash of white light between slides. Shows a brilliant picture, ample in size for easy viewing.

AS A PROJECTOR

Instantly convertible for use as a projector. Scientifically designed optical and condenser light system provides a five foot image size at a 7½ foot throw from machine to screen. New simplified slide feeding device—automatic changeover and ejection. Pictures are lifelike—full of detail.

COMPLETE UNIT FOR VIEWING AND PROJECTING........ $25.00

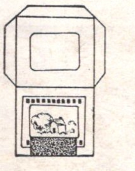
MADE IN U. S. A.

PERFEX 1-2-3 SPEED SLIDE BINDER

FOR ALL STANDARD 2 x 2 FILM SLIDE PROJECTORS

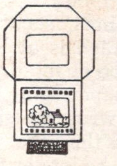
An innovation—the first real advance in slide binder design in years. Just one component piece including glass, mask and binding edge. Extremely simple to use. Metallic surfaced paper reflects heat away from the slide—reduces absorption to a minimum. Completed slide measures 1⅞ x 1⅞ inches—will fit all standard 2 x 2 inch projectors. Reduces the work of minutes to seconds. Only three operations are required to complete the slide.

PER DOZEN 50c



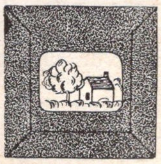
1

Place film over masked opening. Fold up gummed bottom flap to anchor film in position.



2

With film anchored in position as shown above, fold down upper half of binder and moisten gummed flaps.



3

Folding over gummed flaps as shown above completes the slide. A real time saver and surprisingly economical.

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